Employing a Care Ethics Lens to examine the use of Socially Assistive Robots in Meeting the Social and Cognitive Needs of Older Adults

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Abstract

Health systems globally are facing a crisis of care for a rapidly aging population. All countries face challenges ensuring that their health and social systems can accommodate this demographic shift. One proposed solution gaining substantial traction is the use of assistive healthcare robots. In particular, the category of socially assistive robots (SARs) is presented as being uniquely positioned to address the unique psycho-social care needs of aging persons. To date, ethical critiques of the use of assistive healthcare robotics, and in particular social robots, have not closely examined the purported care relationship between such robots and their users. Drawing upon the work of care ethics scholars, I argue that authentic care relies upon capacities inherently reciprocal and responsive in nature, which ultimately precludes socially assistive robots from being useful caring tools.

General Summary

The project of this thesis is to conduct an ethical investigation into the use of socially assistive robots (SARs) with aging adults to assist them with their daily care needs. A rapidly aging population has prompted health systems globally to find novel solutions for the chronic lack of care supports required to meet the unique needs of this demographic. By engaging a care ethics framework, I argue that useful and authentic care relies on inherently reciprocal and responsive abilities that SARs do not possess, ultimately precluding them from being useful caring tools. This thesis explores the applications of SARs technology and contrasts their use against alternative emerging frameworks and programs for aging care. In doing so, I demonstrate there are alternate approaches to the aging care crisis that more effectively meet the diverse needs of aging persons world-wide.

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Table of Contents

List of Abbreviations

SARs	Socially Assistive Robots
LTC	Long-term Care

Figures

Chapter One: Introduction

"Out of the knowledge you mysteriously left
came oil, steel art,
ways to duplicate ourselves..."

Jon Anderson, from *The Robots, the City of Paradise (1969)*

Assistive healthcare robots have garnered much interest as a solution to alleviate the dearth of formal and informal caregivers available to assist an ever-increasing number of older adults. Much of robotics research is committed to the position that such technology is a much more effective intervention than relying on further human caregivers. This thesis aims to assess the claims made by robotics developers in relation to the actual capacities of these technologies to meet the care needs of older adults. More specifically, this thesis will explore whether the growing interest in implementing assistive robots with social components demonstrates a reductive approach to aging, wherein the care of aging persons becomes reduced to completion of instrumental care tasks. By utilizing a care ethics framework, I seek to demonstrate that useful and authentic care ought not to be reduced to the completion of instrumental care tasks[1]. This category of labour related to daily living, often characterized as 'basic' in nature, is often overlooked as a site of opportunity for holistic caring. In part, the project of understanding the use of this kind of assistive technology requires that we consider how care labour functions to develop care as a practice and value. Additionally, I argue that we must also examine how the

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[1] For the purposes of this thesis, I am using 'instrumental caring' synonymously with the phrases 'instrumental activities of daily living (IADL's)', and 'basic instrumental activities of daily living (ADL's) (Guo & Sapra, 2021; Graf 2008) which are commonly used in scholarly research from medicine, nursing and other allied health professionals when assessing the degree of functional ability a person possesses. Both ADL's and IADL's allow health professionals to usefully assess the degree of care support an individual needs (Graf, 2008). ADL's refer to the most basic requirements for living, including feeding, dressing, bathing, and walking, whereas as IADL's include more complex tasks like money management, house-keeping/home maintenance, medication management and cooking/meal preparation (Guo & Sapra, 2021; Graf 2008). I chose to include both ADL's and IADL's in my use of 'instrumental caring' as it best encompasses the range of functions SAR developers have created/are hoping to create SARs to possess.

use of SARs has possibly influenced the way we categorize and give meaning to care labour. I will demonstrate that good care relies upon a set of capabilities that allows the caregiver to contextualize caring tasks within the broader care context in order to incorporate evolving care needs and any possible practical constraints to the provision of care. Considering the scholarly literature for socially assistive robots (SARs) allows for a fruitful discussion of their limited reciprocal means of communications and interaction with their users. I contend that discussions from SAR developers in both scholarly and grey literature overemphasize the interactive and social aspects of this category of technology. Consequently, I argue this precludes SARs from exercising the appropriate caring capacities to complete caring tasks well. I argue that if we uphold that persons ought to be treated as ends in themselves[2], introducing a technology that presents the possibility of removing opportunities for communication and moral solidarity promotes a substandard of care for aging persons.

1.1. Care for a Rapidly Aging Population

Health systems globally are facing a crisis of care for a rapidly aging population. As the quantity and quality of health care improves, people continue to live longer and healthier lives than previous generations. By 2030, Canada will have over 9.5 million seniors who will make up 23 percent of the population (Government of Canada, 2014). Currently, care for Canadians over 65 years of age consumes approximately 44 percent of all provincial and territorial health care

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[2] Here, I am choosing to utilize a common expression found in moral philosophy, 'ends in themselves', which originates from the works of Immanuel Kant (Johnson & Cureton, 2022), who argued that all persons are ends in themselves, meaning that we ought not to treat our fellow human beings as merely a means to an end. Put differently, this phrasing implies that all human beings have a basic moral value that dictates how we should behave towards one another. I rely upon this language in a discussion on care to emphasize that older adults have intrinsic value, regardless of their health status, gender, degree of ability and so on. Thus, I argue that our caring practices ought to reflect this instrumental value that all persons possess. There are further philosophical analyses that critique the arguments and language Kant uses when discussing the Kingdom of Ends formula, but given the breadth of this thesis they cannot be attended to in any fruitful sense here.

budgets, resulting in concern for existing health care systems to keep up with an increasing demand for quality health services (Canadian Medical Association, 2013). Canada is not alone in these concerns; according to the World Health Organization (2021), the world's population aged 60 years and older is expected to total 2 billion by 2050, and all countries are facing increased challenges with ensuring that their health and social systems are able to accommodate this demographic shift. The issue of providing care to an increasing number of older adults is a complex one as it involves addressing a variety of health needs, including ensuring financial security, helping seniors to age in place, promoting general healthy and active aging, and ensuring that seniors have access to the information, services, and benefits that impact their healthcare (Government of Canada, 2014).

One proposed solution gaining substantial traction and interest is the implementation of assistive healthcare robots. Elizabeth Broadbent (2017) notes that humans have been attempting to create "artificial versions of ourselves" (p. 628) as early as 1495, when Leonardo da Vinci designed a mechanical knight, controlled by pulleys that could "sit, stand, move its arms, and raise its visor" (Rosheim 2006, as cited in Broadbent, 2017, p. 628). Vandemeulebroucke, de Casterlé, and Gastmans (2019) contend that industrialization has pushed robotics technology into "the public domain of society and citizens' personal lives" (p. 128), and that the recent interest in using assistive robots with aging populations is therefore unsurprising. Assistive robots have been implemented into a number of fields; including as remotely controlled robotic surgeons, and as therapeutic interventions for children with autism spectrum disorder (Barcaro et al., 2018; Majeed, 2017). Vandemeulebroucke and colleagues (2019) assert that socially we have come accustomed to machines "performing tasks that recently would have required skilled human judgement and practice" (p. 128). Consequently, the use of robots as a proposed solution to address the strain on formal and informal caregivers caring for a rapidly aging population would appear to be a natural next step for a technologically driven society.

SARs are a category of assistive robots of unique consideration for ethical analysis. SARs were first described by Feil-Seifer and Matarić (2005) when they realized that the category of ‘assistive robots’ no longer reflected the scope of tasks and capabilities of new models of assistive robots. They noted that socially assistive robots had moved beyond just providing physical assistance to a user, into assistance through “non-contact interaction” (Feil-Seifer & Matarić, 2005, p. 465). Similarly, Kachouie and colleagues (2014) helpfully draw a distinction between SARs and other kinds of assistive robots, noting that things like ‘smart’ wheelchairs, artificial limbs, and exoskeleton technology count as assistive robots but are “principally not communicative " (Kachouie et al., 2014, p. 369). SARs are those robots that emphasize “the importance of social interaction in the process of providing specific assistance” (Kachouie et al., 2014, p. 369). Developers of SARs assert that this technology can contribute to “therapeutic protocols aimed at improving or maintaining residual social, cognitive and global functioning of older adults” (Louie, McColl & Nejat, 2014, p. 140) in a more cost-effective way than using health care staff.

To date, ethical critiques of this technology have not considered the purported care relationship between such robots and their users. Other equally relevant ethical arguments have been raised, including considerations of how SARs may impact an older adult’s privacy, as well as concerns that this technology is inherently deceptive (Johnston, 2022; Sharkey & Sharkey, 2012; Sparrow & Sparrow, 2006). The purpose of this thesis is to nuance existing ethical dialogue on this issue by narrowing in on the notion of care. By focusing on the care dynamic between robot and user, I center the needs of the aging persons, and ask to what degree SARs can usefully or authentically meet these care needs.

By drawing on the works of scholars of care ethics, in addition to thinkers from the disciplines of medicine, nursing and philosophy, I will illustrate what counts as both a caring activity and what values underpin authentic and useful care. Care ethics is a stream of ethical theory that asserts that "there is moral significance in the fundamental elements of [our] relationships and dependencies" (Sander-Staudt, 2021, para. 1). Care ethics provides an ethical framework from which to evaluate caring tasks to determine when the provision of care is merely adequate and when it is truly authentic and comprehensive (Held, 2006). Moreover, care ethics understands the practice of caring as one that involves "both particular acts of caring and a general 'habit of mind'" (Tronto, 1993 p.127) such that the care provider should understand their actions within the broader care context, including recognizing conflicting and evolving care needs. In referencing a care ethics framework, I demonstrate that while SARs have been designed to carry out certain tasks that we recognize as being part of traditional care tasks, we ought to be cautious in assigning (consciously or unconsciously) moral agency to this category of tool. While SARs represent a novel and unique category of caring tool, the use of an anthropomorphized design does not grant them any more agency in caring scenarios than other care tools, like a stethoscope or wheelchair.

Importantly, I must note that the heart of my critique is focused on the way this category of technology is being discussed and implemented in the aging care sector. My focus is on how SARs are being definitively advertised as being able to support or otherwise carry out caring tasks. The uncritical implementation of this technology, under the guise of providing authentic and useful care, speaks to an understanding of aging persons as being reducible to the completion of instrumental care tasks.

I argue that useful and authentic care relies upon caring qualities that are inherently reciprocal and responsive in nature. By engaging a care ethics lens, I demonstrate that care ought to be understood as a reactive practice that can address the evolving needs of the care receiver, in addition to any conflicts or limitations to resources that may be hindering the care process. As articulated throughout, good care is more than the completion of singular care activities. Caring well relies upon some deeper qualities possessed by the caregiver, and I argue that moral presence ought to be recognized as a goal of good caring relationships.

In demonstrating that SARs have a much more limited means of interaction than is presented in descriptive literature from SAR developers, I argue that SARs fail to meet the standard of a useful care tool. While the needs of the end user, the older adult, is my main concern for this project, determining the efficacy and usefulness of this technology is also pertinent in the broader conversation about allocating resources to address the gap in care needs for this population. In asserting that authentic care relies upon capacities inherently reciprocal and responsive in nature (ultimately precluding SARs from being useful caring tools), it is therefore unethical to market SARs as possessing sophisticated caring skillsets sufficient enough to meet the psycho-social care needs of older adults. Thus, if we allow assistive robotics technology to be implemented in an extensive way, without the involvement of human carers, we will be promoting a substandard provision of care to older adults in our communities

1.2 Outline of Thesis

Chapter 1 will focus on the care needs of older adults, including examining how healthy aging is defined. I will delineate the typical health needs of aging persons and discuss some of the barriers to providing comprehensive care to older adults. Additionally, I will briefly address the role ageism plays in our understanding of health care. I will discuss how people can become disenfranchised by their aging and examine how ageism can impact access to comprehensive aging care support and healthcare more generally. Chapter 2 will more closely define what counts as a socially assistive robot and examine some of the most recent models of SARs with the goal of delineating the range of limitations of their interactive and communicative abilities. In doing so, I lay down a foundation for discussing how SARs fail to meet the standard of being a useful caring tool for aging persons, which is the concern of Chapter 3. Additionally, Chapter 3 will explore several concepts associated with care, including defining what I mean by ethical care/caring activities and the required capacities for caring well. The final chapter, Chapter 4, incorporates the concepts discussed in the preceding chapters to develop the ethical analysis of the use of SARs with dependent older adults. Having demonstrated that useful and authentic care relies upon caring qualities that are inherently reciprocal and responsive in nature, I will argue that SARs are precluded from being useful caring tools on the grounds that they are ultimately amoral agents in the care relationships, and to advertise them as possessing qualities and capacities they do not possess risks encouraging the provision of sub-standard care to aging persons in our society. This chapter will also include a discussion of alternatives to traditional models of elder care. In citing examples of programs and interventions that appropriately embody caring values, we may consider a future wherein aging persons are treated as ends in themselves and whose care supports demonstrate due concern for the unique needs of an aging population.

1.3 The Aging User of an Assistive Robot

Older adults have unique health needs, both physiologically as well as psycho-socially, that make them a demographic of interest for SARs developers. SARs are, by definition, assistive, however their engineers have rightly recognized aging populations have distinct care needs and have endeavoured to implement SARs technology to help ameliorate them. Importantly, this thesis is not relying on an assumption that all persons age in the same way or necessarily need the same degree of support as they age. Rather, my aim in this portion of the chapter is to establish that there are kinds of physiological and psychological declines that we can say are typical of the aging process. Furthermore, we must also consider how healthy aging is defined.

The purpose of defining what we consider to be healthy aging is important in establishing what kinds of definitions of healthy or successful aging are implicit in the design and implementation of SARs. By exploring what factors inform an authentic and inclusive concept of aging, I will later contrast this with the values that are (either consciously or unconsciously) being promoted by the use of SARs. It is important to note that there may be other conditions that affect a person who is young in such a way that they too could benefit from the use of this kind of assistive robot. However, I am interested in the unique relationship between older adults and this kind of robotics technology because of older adults' experiences with ageism, which can often disenfranchise them in many ways. A person who has become dependent on others for assistance with day-to-day living is especially vulnerable to exploitation and paternalistic interventions in their care. Consequently, novel care interventions need to be assessed to determine whether or not they appropriately meet the needs of the target user population. This ought to be the case for any and all assistive technologies and all user populations; however, it is an especially important inquiry when considering a population who is often spoken *for*, instead of being spoken *to*.

1.4 The Health Concerns of Aging Populations

SAR developers are interested in using their technology to alleviate the care crisis for older adults. The growing population of aging persons presents unique considerations when conducting an ethical analysis of assistive technology. Veazie and colleagues (2019) note that older adults are more susceptible to becoming socially isolated due to age-related changes in health and social status, including impaired hearing and vision, reduced mobility, and the deaths of family and friends. These factors limit an older adult's ability to create "sustained meaningful connection[s] to other people" (Veazie et al., 2019, p. 1), which in turn results in poorer overall health, an increased risk of dementia and mortality, as well as more physician visits overall. Older adults are also disproportionately prone to developing depression, anxiety, and other mood disorders (Reker, 1997). An increased likelihood of experiencing social isolation, loneliness, and inadequate finances are also associated with aging (World Health Organization, 2015). The World Health Organization (2015) also notes that social isolation is a strong predictor of the likelihood of elder abuse and impacts an aging person's ability to access essential health services during an emergency. Moreover, social isolation is self-perpetuating, as it can lead to the deterioration of social skills by way of disuse and cause the disruption of opportunities for socialization (Government of Canada: National Seniors Council, 2014). Bedaf and colleagues

(2013) conducted three different focus groups across the Netherlands, United Kingdom and France with older adults and formal/informal caregivers in order to determine what activities "pose the greatest problems for elderly people seeking to remain independent" (p. 1). The authors argue that while there is no single unanimous concern amongst older adults, their findings from the focus groups demonstrate that older adults are largely concerned with maintaining their mobility and ability to care for themselves, as well as expressing fears of becoming socially isolated.

The aging process also contributes to many chronic conditions and overall degeneration that impacts an individual's quality of life and independence. While other factors such as socioeconomic status, lifestyle and the presence of chronic disease play a role in decline, the normal aging process typically sees a decrease in cognitive skills, including deterioration in memory, as well as changes to the speed of information processing (World Health Organization, 2015). Older age is also highly associated with developing osteoarthritis, chronic obstructive pulmonary diseases, diabetes, and dementia (World Health Organization, 2021).

1.5 Barriers in Access to Care for Older Adults

The following subsection addresses the current deficits and shortages in care resources our healthcare system is facing in providing care for a rapidly aging population. In confirming the deficits in aging care resources, I acknowledge that SAR developers have rightly recognized a need within our healthcare systems and demonstrate why the use of SARs may be appealing to those looking for solutions to this crisis of care resources.

1.5.1 The deficits in Care Resources for Older Adults, or, Addressing the 'Grey Tsunami'

An additional concern faced by health systems is a shortage of adequately trained care staff and services to provide for the health needs of aging persons. Note that while health systems globally are attempting to address scarcities in aging care resources, the focus for this section will be on the strain faced by Canadian systems. The number of long-term care (LTC) facilities has been decreasing, and LTC facilities have fewer available beds per facility (Canadian Health Coalition, 2021). This shortage of LTC beds and facilities is further exacerbated by the chronic issue of understaffing in LTC facilities. Low staffing numbers results in overburdened care teams, which in turn increases the likelihood of workplace injuries, probability of resident hospitalizations and general increases to associated health system costs (Long-Term Care Staffing Study Advisory Group, 2020; International Council on Active Aging, 2019; Otto, Bischoff & Wollesen, 2019). Armstrong, Armstrong and Choiniere (2015) asserts that reform strategies consistently neglect to recognize that the “conditions of work are the conditions of care” (p. vii) and assert that provincial and federal governments fail to acknowledge the unattractive working conditions LTC staff face. Such conditions include non-competitive wages and benefits, a higher likelihood of experiencing workplace violence and inadequate education and training barriers (Bigo, 2010; Armstrong Armstrong & Choiniere, 2015, p. 19).

When access to professional care supports is not possible, the burden of care falls to informal caregivers, typically family members. Research consulting this demographic has found that approximately sixteen percent of informal caregivers (of a recognized two million) report distress related to their role (Canadian Institute for Health Information, 2010). Informal caregivers reported this distress stemmed from having to contribute a high number of hours per week in caring for loved ones, in addition to feeling like they were under-skilled to care for aging persons with complex and advanced illnesses (diseases associated with declines in cognition and daily functioning and/or aggressive behaviors were noted as especially difficult to provide care for) (Canadian Institute for Health Information, 2010). Moreover, while informal caregivers report that there is much emotional fulfillment that comes from caring for a family member or friend, they also report that providing such care is emotionally demanding in that it takes away from time they could spend with their own support systems and is a general source of stress and fatigue (Turner & Findlay, 2012).

The provision of healthcare to aging persons is also uniquely impacted by ageism. In simple terms, ageism can be defined as prejudice on the grounds of age. This can take the form of prejudicial attitudes, discriminatory practices, as well as institutional policies and practices that perpetuate stereotypical beliefs about aging persons (World Health Organization, 2015). Bill Bytheway (1995) generated a comprehensive working definition in his book aptly titled "Ageism":

> 1. Ageism is a set of beliefs originating in the biological variation between people and relating to the ageing process
>
> 2. It is in the actions of corporate bodies, what is said and done by their representatives and the resulting views that are held by ordinary ageing people, that ageism is made manifest. (p. 14)

The emphasis here is on demonstrating that ageism is evident in both explicit and implicit ways, and detecting it is often more difficult than one initially anticipates. Ageism ranges from "well-meaning patronage to unambiguous vilification" (Bytheway, 1995, p. 14) but is always rooted in a negative attitude towards the aging process and often results in stereotypical presumptions on the part of competence of aging persons including often paternalistic and infantilizing attempt at protection. Examples of ageism in healthcare can be found when practitioners belittle geriatrics and gerontology as a profession, in the under- and over-treating of older patients, ageist talk in the healthcare setting (e.g. ‘elder speak’; analogous to baby-talk) and institutional ageism (e.g. clinical practice guidelines developed without the consultation of aging persons) (Hoyt, 2021).

Incorporating an intersectional approach to ageism is also integral to understanding the health of those who are manifoldly marginalized/disenfranchised in their old age. One’s experience with ageism will be impacted based on the intersection of other facets of one’s identity, including gender, ability, sexuality, and race. For example, financial precarity in late life is more likely to be experienced by women owing to factors like longer life expectancy, labor force participation patterns, and wage inequality (Ontario Human Rights Commission: Policy and Education Branch, 2000; Reker, 1997). LGBTQIA+ identifying aging persons face a disparity of residential care options, as many care homes either explicitly do not allow queer and trans identifying individuals/couples into their facility, or do not mandate for ongoing cultural competence training for staff, and as such many LGBTQIA+ aging persons ‘re-closet’ themselves to avail of care towards later in life (Löf & Olaison, 2018). Racial minority groups face similar barriers; research has shown that aging persons from Asian, African, and Latin American communities have a lower probability of receiving social insurance or private pension benefits and often struggle with a loss of cultural community in residential care (MacLean et al., 1987). Thus, the systematic barriers for aging in place of a white, able-bodied man will differ greatly from those of a queer-identified woman from an ethnic community.

1.5.2 How Ageism Impacts the Development of Aging Supports

Understanding the positioning of aging persons in the healthcare system is integral when examining how ageism moves at a macro level, that is, through institutional policies or cultural traditions. Macro-level ageism integrates the social and cultural manifestations of ageism (e.g. ageism that is embodied in language, literature, and mass media) into specific policies and actions that target older persons (Iversen et al., 2009). For example, the unfair treatment of older employees in an organization evident in things like discriminatory hiring practices, or the use of pension plans that have a mandatory retirement age (Iversen et al., 2009). Furthermore, while patient engagement is recognized to be an integral part of healthcare reform, aging persons are chronically under-consulted, despite being one of the major users of the healthcare system (Elliott et al., 2016). Elliot and colleagues (2016) noted in their realist synthesis review of literature on patient engagement that aging persons have unique barriers to overcome for engagement because of their vulnerability and health status[3]. Meaning, aging persons must rely heavily upon support systems like family, friends, and caregivers to help them advocate during the health care decision making process. Additionally, Holroyd-Leduc and colleagues (2016) note there are a number of unconsidered barriers faced by aging persons when attempting to become involved in research, health care decision making and the creation of health policy, including consultation locations that do not consider the mobility issues faced by many aging persons, and consulting parties co-opting or tokenizing aging persons during the engagement effort.

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[3] A realist-synthesis review is a type of methodology that is used to synthesize a wide variety of evidence in order to establish the mechanisms that make an intervention work (or not work). Notably, a realist synthesis approach asks "'What works for whom under what circumstances?' rather than [just] 'What works?'" (Rogers & Laidlaw, 2014). The emphasis in this type of review is not to merely establish a causal 'X resulted in Y' relationship, but also seeks to illustrate the context the relationship exists in, and how that impacts the outcome of the intervention (Pawson et al., 2005).

The point of elucidating the unique health needs of aging persons and identifying how systemic ageism impacts their ability to access health services is to create a context for discussing the interest in using assistive robots with this demographic. Much of the literature on assistive robots written by their developers asserts that this technology is a viable solution to providing care that addresses the health needs of seniors while working to offset the existing scarcity of care resources and the burden of care for both formal and informal caregivers. The growth and development of SARs as a category of assistive technology stems from the recognition on the part of developers that many aging persons require some degree of assistance with daily living activities as they age (Moro et al., 2018; Pino et al., 2015; Louie, McColl, & Nejat, 2014). I will return to the reasoning and justification for the design and use of this technology in more detail in Chapter Two. With that said, I will also elaborate on how much of the descriptive literature on SARs overstates the usefulness of this technology in caring relations, to the detriment of the care needs of the older adult user.

1.6 What is Healthy Aging?

Not all people age in the same way; acknowledging this is an important part of avoiding making generalizations about aging persons. Moreover, there is a split consensus on what defines aging well, or healthy aging. Bowling and Dieppe (2005) assert that there is an overemphasis on biomedical models of aging, which focus on the "optimisation of life expectancy while minimising physical and mental deterioration and disability" (p. 1548). With a biomedical model, the markers of successful aging are the absence of chronic disease and risk factors for disease, in addition to "high levels of independent physical functioning, performance, mobility, and cognitive functioning” (Bowling & Dieppe, 2005, p. 1549). The authors assert that “the medical model is so dominant that few health professionals are aware of psychosocial aging” or the distinct markers of a healthy psychosocial self (Bowling & Dieppe, 2005, p. 1550). Moreover, the authors contend that psychosocial models of aging need equal emphasis in the development of aging supports. They write:

> Satisfaction with one’s past and present life has been the most commonly proposed definition of successful ageing, and is also the most commonly investigated.[15] Its components include zest, resolution and fortitude, happiness, relationships between desired and achieved goals, self concept, morale, mood, and overall well being. Continued social functioning is another commonly proposed domain of successful ageing. It encompasses high levels of ability in social role functioning, positive interactions or relationships with others, social integration, and reciprocal participation in society.[16] (Bowling & Dieppe, 2005, p. 1549)

Thus, if we hold that an encompassing model of aging health must incorporate the needs of both the physical *and* psycho-social self, we must address whether a robot advertised as having a useful social function for its user is actually successful in meeting that goal.

Furthermore, Bowling and Dieppe (2005) contend that biomedical models of aging do not account for the reality that there are many variables (often uncontrollable ones) that impact how one ages. These include, but are not limited to, variances in cultural values; demographic and socio-economic characteristics (e.g. age, sex, rural-urban residence, household income, etc.); health related behaviours (e.g. consumption of alcohol and drugs, smoking, level of physical activity, etc.); psycho-social factors; the impact of chronic health conditions; and the ability to access medical care throughout one’s life (Statistics Canada, 2022). The World Health Organization (2021) similarly notes that diversity is one of the key considerations for the development of policy around healthy aging, stating that “there is no typical older person” (para. 7). Similarly, Bowling and Dieppe (2005) assert that “[we need to recognize] that older people are not a homogeneous group, [and so] health professionals need more balanced, interdisciplinary perspectives of older age” (p. 1550). These positions are important to the discussion of the implementation of assistive technologies because we must ask ourselves what notions of healthy aging are implicit in the interest in, and design of, socially assistive robots.

1.6.1 Aging, Dependency and Autonomy

A fruitful discussion of how we define healthy aging must also consider the idea of dependency, and how it influences our definitions. Marian Verkerk (2001) asserts that there is a crucial distinction between “an ideal of autonomy in terms of self-sufficiency and independency … and autonomy in terms of the moral capacity to make one’s own choices in life” (p. 291). Verkerk (2001) contends that promoting an idea of autonomy that emphasizes self-sufficiency and complete independence from others means that values such as “trust, caring and responsibility” (p. 291) become neglected and we mistakenly treat autonomy as a moral competency that ought to operate separately from other persons and relationships.

To conflate self-sufficiency with moral agency risks promoting a kind of care and the development of aging care supports that may impede a person’s ability to exercise their autonomy. If our efforts to develop supports for aging persons merely results in them becoming non-reliant on those around them, this does not adequately create opportunities for an older adult to exercise agency. Recent conceptualizations of ‘successful’ aging simply act to reinforce the apparent moral failings of dependency, such that needing homecare, moving into a LTC facility or otherwise relying on others becomes a sign of personal/moral failure (Holstein et al., 2011).

This distinction is important for an ethical analysis of SARs because of how SAR developers have framed the potential benefits for using this technology with an aging population. As introduced earlier in this chapter, there are different understandings of what healthy and successful aging look like. Biomedical models currently dominate clinical discussions of aging, meaning that "the current policy focus is on disease prevention and health promotion for achieving successful ageing, …. [where] most behavioural actions for successful ageing continue to promote health related behaviours and engagement in cognitively stimulating activities" (Bowling & Dieppe, 2005, p. 1550). The developers of SARs discuss the application and goal of this technology in very similar terms: Chan and Nejat (2012) state in a study discussing the modular learning‑based control architecture of the robot Brian 2.0™, that these kinds of robots "can be used as aids in providing cognitive training and social interaction in both health‑related and education fields" (p. 1-2), with the overarching goal "to promote the psychological well‑being of older adults" (p. 1). Similarly, Goher and colleagues (2017) state that "it is obvious that older adults benefit from assistive robots and devices to retain their autonomy, diminish health-care needs, [and] accomplish daily tasks" (p. 1). Sharkey and Sharkey (2012) share a similar position, contending that the health needs of older adults can be met "through the use of robot technology developed with the aim of increasing the autonomy of the elderly, and decreasing their dependence on other people" (p. 30).

However, conceptualizations of aging that allow for little to no dependence are fundamentally unrealistic and do not reflect the inherent relatedness all persons share. Verkerk

(2001) argues that by incorporating a care ethics perspective into discussion of autonomy, we may nuance our understanding of moral agency. She writes:

> From a care perspective, autonomy is criticized on two grounds: First, the ideal of autonomy in terms of independence and self-sufficiency is criticized. Instead an idea of interdependency, descriptively and prescriptively, is emphasized. Secondly, autonomy as moral competency should get rid of its individualistic connotations. Instead a notion of relational agency should be introduced as underlying the concept of autonomy. (Verkerk, 2001, p. 293).

Importantly, the emphasis here should not fall on Verkerk's use of a care ethics lens as a framework from which to examine autonomy. Rather, I want to highlight her conclusion that autonomy need not be in opposition to relationships that are inherently dependent. She argues that "the ideal of self-sufficiency rests on the idea that a good life is a life in which we do not need the help or support from anyone in meeting our needs and carrying out our life plan" (Verkerk, 2001, p. 291). This idea does not reflect the reality that most aging adults will at some point in their lives rely on others to help them navigate their daily lives, whether due to physical frailty, cognitive decline, or other changes typical of the aging process. Importantly, while the developers of SARs are using the term autonomy in a lay sense, to refer to a sense of self-sufficiency, Verkerk's perspective lends itself to a critique of the notions of healthy aging implicit in the design and use of SAR technology – namely, that dependency and autonomy are not mutually exclusive notions, and that any encompassing definition of healthy aging must reflect our interconnected and dependent reality.

1.7 Outlining the Problem

To reiterate, this thesis seeks to demonstrate that SARs are not suited to meet the goals and values that define successful and useful caring relationships, particularly with respect to the unique care needs of an aging population. Furthermore, I want to explore if the growing interest in implementing assistive technologies is merely symptomatic of a health care system that is not prioritizing alternative efforts that retain humanity in medicine and long-term care. In this thesis I will consider whether the interest in using SARs as a caring tool is indicative of a model or approach to aging care that reduces older persons to the completion of instrumental caring tasks.

In the remainder of this thesis, I will demonstrate that comprehensive and useful caring is not merely about the completion of instrumental caring tasks. By referencing the works of scholars of care ethics I will illustrate how caring also attends to the sort of existential needs that human beings grapple with when faced with disease, aging and death. I argue that even the lighter, less existential psychosocial health needs of older adults are unlikely to be met by a robot with limited communicative abilities. Moreover, even if a robot were to develop highly sophisticated ways of communicating, they are still precluded from generating any kind of useful caring presence precisely because they are non-human. I will demonstrate good reasons why authentic care interactions are grounded in an empathy generated from a recognition of our shared human condition.

The following chapter more closely examines socially assistive robots by exploring our relationship with technology in the context of medicine and health improvement. This chapter explicates the designs of some recent models of socially assistive robots in order to demonstrate the limitations of their designs in the context of caring capabilities.

Chapter Two: Socially Assistive Robots

In Chapter One, I introduced the category of assistive robots that are the subject of my ethical analysis: socially assistive robots (SARs). In order to fully understand the ethical implications of the use of these robots, we require a fuller description of the variety of SARs currently being piloted or studied for use with older adults in order to differentiate them from other kinds of assistive robots. This is the task for this chapter.

First, it is necessary and helpful to locate assistive robots in their first category: robot. Elizabeth Broadbent wrote in "Interactions With Robots: The Truths We Reveal About Ourselves" (2017) that significant cultural interest in the design and creation of autonomous robots began in 1950 when Alan Turing created the Turing Machine, which was essentially the first model of the general-purpose computer. In the same year, Broadbent (2017) notes, the first digitally operated programmable arm was created, and, after this milestone, robotic engineers quickly turned to creating social robots.

Robots have now quickly become an established part of our world. Various applications have been developed for robotics technology, including for use as remotely controlled robotic surgeons, therapeutic interventions for children with autism spectrum disorder, and, more recently, as an assistive companion for older adults (Barcaro et al., 2018; Majeed, 2017). The latter category of robots, referred to in the literature and this thesis as SARs, are those that emphasize "the importance of social interaction in the process of providing specific assistance" (Kachouie et al., 2014 p. 369). Moreover, this kind of robot is being made "to mimic humans most closely—in looks, mind, emotional expression, and behavior" (Broadbent, 2017, p. 629).

The following sections of this Chapter will provide a detailed description of the existing design features of some of the most recent models of SARs to further differentiate them from other kinds of assistive robots. Furthermore, this chapter will also illustrate the applications of SARs according to their developers. I echo the position of Sparrow and Sparrow (2006) who argue that there is an "ambiguity which infects descriptions of what these machines are (or will be) capable of" (p. 153). By developing the description of SAR designs, I will provide further evidence for my arguments in Chapter Four that there are deeper moral implications for the relationship between SARs and older adult users compared to other models that do not have a psycho-social component incorporated into their design.

Here is also a crucial point in which to further delineate the scope of this critical analysis of assistive robots. The category of socially assistive robots is a relatively new one, and certainly is not yet a product that is wide-spread in its use. It is essential to this thesis that I delineate the scope of my critique. The intention of this project is not to analyze the field of robotics engineering. For example, my critique does not lie with the fact that SARs are not yet a mature product and therefore they ought to be precluded from protracted daily use amongst older adults. I am not examining the literature on user acceptance or evaluation experiments focusing on usability. Rather, I am endeavouring to take one example of an assistive technology that is being advertised as a particular kind of tool, and I am analyzing it via a care ethics framework. The category of assistive technologies includes a wide range of devices, and socially assistive robots are of particular interest for ethical analysis because they possess design features not generalizable to the broader category of assistive devices. SARs are distinct because of the intentional proximity to a human's physical appearance and emotional affect.

Moreover, the relational expectation between a human and a human-like robot are very different from that of a human and an animal-like robot, which is the other common example of sophisticated assistive robots. [4] While we are affectionate with, and in a sense care about, our house-hold pets, we would not expect them to understand our emotions like another human being would. Consequently, our expectations of our interactions with a robot resembling a dog or other animal are similarly quite different than of our interactions with a robot that in some way resembles a human being. With that said, the aim of this critique is not to disparage the efforts of SAR developers, as the ever-growing body of literature on this topic is evidence that current models of SARs are continuing to be refined and modified. Moreover, just as I could not make general statements about the perspectives and motives of the developers of the stethoscope, or blood-pressure cuff, I cannot assume the intentions of SAR developers, which is why SARs as a category of assistive technology is the focus for this thesis. My concern lies with the *application* of the technology, not the degree of sophistication it currently possesses.

2.1 What are Socially Assistive Robots?

SARs are one of many kinds of models being developed in the field of assistive robotics, which in recent years has become largely focused on creating more complex human-robot interactions. SARs have been designed to assist a user with a variety of daily living tasks, which for an older adult include (but are not limited to) helping with meal preparation, engaging the user in social activities like playing card games, and offering reminders to take medications. Many developers of SARs focus on programming these robots to provide assistance with tasks specific to the concerns of older adults, with an emphasis on creating a robot with a strong interactive presence. Recall from Kachouie and colleagues (2014) that the main difference

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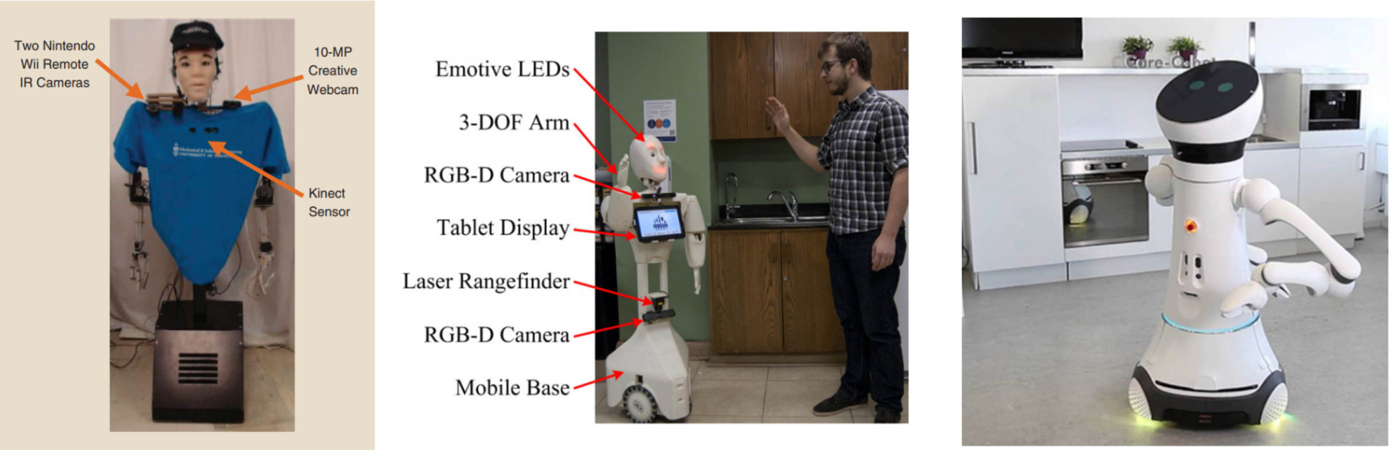
[4] Popular examples of animal-like assistive robots include PARO™, a robotic seal that has been increasingly used with older adults suffering from dementia; Aibo™, a robotic dog companion designed by Sony Corporation; and the MiRo-e robot, designed by Consequential Robotics, which is a class-room tool to help children learn about coding (Prescott & Robillard, 2021; Jung, van der Leij & Kelders, 2017).

between SARs and other kinds of assistive robots is that many other technologies fall into the category of ‘assistive’ but are “principally not communicative” (p. 369) and are not advertised as having a social or cognitive-health related benefit for the user.

Pino and colleagues (2015) describe six broad categories of assistive robot designs: machine-like robots, human-like robots, androids, mechanical human-like robots, animal-like robots, and mechanical animal-like robots. SARs overlap the categories of human-like robots and mechanical human-like robots, “whose form resembles a human body and/or have human facial features (e.g., eyes, nose, mouth, eyelids, etc.) (Pino et al., 2015, p. 2). While there is a great deal of variety in the design features of one SAR model over another, in examining SARs that have gained significant research and media attention, it is clear that such technology is meant to resemble human beings both physically and psychologically. For example, consider the assistive robots Brian™, Casper™ and the Care-O-Bot™ (See Figure 1).

Figure 1



(A) (B) (C)

Note. Examples of Socially Assistive Robots: (A): Brian 2.1™ (McColl, Louie, & Nejat, 2013, p.2) Image Copyright 2013 by Ieee Robotics & Automation Magazine. Reprinted with permission. (B): Casper™ (Bovbel & Nejat, 2014, p.1) Image Copyright 2006 American Society Of Mechanical Engineers (ASME). Reprinted with permission. (C): Care-O-Bot™ (Lotfi, Langensiepen & Yahaya, 2018, p. 3) Image Copyright 2018 by MDPI. Image reprinted with permission.

These robots are intended to resemble humans from the waist up in that they have been built with a human-like torso with two arms and a head with a synthetic ‘face’ or mask that mimics emotions like ‘happy’, ‘neutral’ and ‘sad’. All three robots depicted in Figure 1 are programmed with some variety of verbal interactions (e.g. encouraging meal preparation and consumption) that are anthropomorphic in nature. For example, the Casper™ robot can say phrases like, “My favorite food is pizza, it’s delicious”, and “We’re finished making the sandwich, it looks very delicious” (Autonomous Systems and Biomechatronics Laboratory, 2013, 1:00 & 4:04). Similarly, the SAR Brian™ also imitates a human affect; it can say to the user “The main dish smells amazing. Why don’t you pick up some food with your spoon?” (McColl, Louie, & Nejat, 2013, p. 79)

The essential observation here is that robots like Brian™, Casper™ and the Care-O-Bot™ are meant to resemble human beings both physically and psychologically. The physical resemblance is clear from their visual designs, while the psycho-social resemblance is evident in the robots' simulated emotional responses and speech scripts that include affective and descriptive language. Designers of these robots describe this proximity to human capabilities as necessary for the robot's therapeutic goals of providing social stimulation while assisting an older adult, in addition to generating acceptance from this user base (Sorell & Draper, 2014; McColl, Louie, & Nejat, 2013; Louie, Han & Nejat, 2013). McColl and Nejat (2014) assert that designing robots such that they can both read and reproduce emotive verbal and body language ostensibly imbues SARs with the capacity to "share information with, relate to, and understand and interact with people in human-centered environments" (p. 261). A study exploring user acceptance of SARs amongst older adults found that human-like communication was preferred over human-like appearance, but that participants also expressed positive feelings towards the robot's humanized 'face' and emotional communication abilities (Moro, Nejat & Mihailidis, 2018, pgs. 147-148).[5] As previously stated, robots are no longer merely performing caring tasks, they are being designed such that they complete these tasks while bearing a likeness to human physicality and behaviour. Moreover, this likeness is advertised as providing a crucial psycho-social presence in the lives of older adult users.

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[5] The scope of this project does not allow for an exhaustive discussion of the effect, however, the Uncanny Valley phenomenon is certainly relevant to a discussion of human and robot dynamics, particularly in reference to the design of a robot's physical appearance. The effect, coined by Masahiro Mori (1970), asserts that as robots become more human-like in their design, they become more appealing to a human user, but only up until a certain threshold. Mori (1970) posits that for particular robots, our affinity drops off (into the 'valley', visible on a graph) into a sense of uncanniness or eeriness. In sum, a robot's design can only come so close to a life-like representation of a human being before creating a sense of unease in the user.

2.2 The Application of Socially Assistive Robots

SAR developers assert that this technology is uniquely posed to assist with the care of older adults. Louie, Han and Nejat (2013) assert that:

> ... the current state of long-term care facilities has shown that there is a need for increased staff-to-resident ratios to support and sustain recreational activities due to residents being understimulated …. Although there exists a demand for more staff to incorporate such activities, it is projected that the supply of health care workers will substantially decrease as they too are aging and a large number of them will retire in the next several years. Therefore, there is a need to investigate the use of technological solutions as alternative measures in order to improve the quality of care and quality of life of residents in long-term care facilities. (p. 1)

Ficocelli, Terao, and Nejat (2016) articulate a similar rationale for the use of SARs, arguing that "the development of assistive robots can help meet the current and future demands put forth by an aging population and healthcare staff shortages" (p. 2911). Consequently, it appears SARs developers are aware of the current limitations and constraints on aging care resources and propose that implementing this technology is the most effective method to optimize these resources.

The use of SARs technology is not yet mainstream in the aging care sector. Pekkarinen and colleagues (2020) note that for the most part, socially assistive robots have only been piloted in real care institutions in small trial studies and while "there are some test homes and pilot projects, but few care robots are actually used in the care of older people" (p. 5). Slow uptake can be, in part, chalked up to muddied market categories in which to advertise the technology, in addition to logistical concerns on the part of institutions regarding the need “for structuring elements, such as guidelines, standards, labels and key performance indicators, to enable acting in practice, provide structure how to act in practice and to monitor and evaluate [assistive technologies” (Arentshorst & Peine, 2018, p. 1332). However, recent studies indicate that market and institutional interest in researching and otherwise developing this technology continues to grow rapidly (Arentshorst & Peine, 2018; Franke et al., 2021; Pekkarinen et al., 2020).

Developers of SARs argue that these robots function not only to aid in the assistance of “personal self-care and independent living activities” (Louie, McColl & Nejat, 2014, p. 140) but also to help provide cognitive stimulation that is integral to maintaining good health in older adults (Ficocelli et al., 2016; Louie, Han & Nejat, 2013). Given the chronic loneliness and social isolation faced by older adults (MacCourt, 2017; Sorell & Draper, 2014), SARs have also been suggested as companions to alleviate loneliness (Pino et al., 2015).

SARs have particular social interactive features intended to facilitate user engagement and completion of their programmed care task. Consider the SAR Brian™; developer Goldie Nejat asserts that “Brian is a social robot but he also takes into account emotions of the user” (University of Toronto, 2013, 0:53) by detecting the affect of the user and responding with a relevant ‘emotion’ to keep the user engaged with the interaction. Brian’s™ design is intended to resemble a human being from the waist up (see Figure 1, A), in that it is built to have a torso/trunk with two arms and a head with a synthetic facemask that mimics emotions like happy, neutral, and sad (McColl, Louie, & Nejat, 2013). Brian™ is programmed with assistive interaction activities, including encouraging meal preparation/consumption and playing a card game with the user. For meal-eating activities Brian™ is programmed with motivational cues meant to encourage, orient, or instruct the user with the tasks and behaviors necessary for eating. This includes imitating human effects (recall the example referenced above: Brian™ says to the user “The main dish smells amazing. Why don’t you pick up some food with your spoon?” [McColl, Louie, & Nejat, 2013, p. 79]); providing additional assistance between task steps, like pointing out where eating utensils are located; and telling the user pre-programmed food-related jokes. However, according to available descriptive literature, Brian’s™ social interactions appear to be limited to its pre-programmed scenarios, and it is unable to produce organic vocal interactions outside of these scripts.

Similarly, Casper™ is another SAR described as a “human-like robot with an expressive face, two arms, and a torso mounted on an omnidirectional base” (See Figure 1, B) (Moro, Nejat & Mihailidis, 2018, p. 15:12). Like Brian™, Casper’s™ face was designed to imitate human emotional facial expression, including happy, sad, surprised, angry and neutral (Moro, Nejat & Mihailidis, 2018; Bovbel & Nejat, 2014). Casper™ is currently intended for helping older adults (specifically ones with cognitive impairments like dementia and Alzheimer’s) with regular kitchen activities.

Once the robot has been turned on, Casper™ escorts the user to their kitchen space, where the robot presents a list of potential recipes via its tablet. Once a recipe has been selected, Casper™ will provide information about where food items and cooking utensils are stored and walks the user through each step of food preparation by way of pre-recorded videos that are watched via its tablet. Casper™ is also programmed with anthropomorphized phrases intended to encourage cooking and eating, such as: “My favorite food is pizza, it’s delicious”, and: “We’re finished making the sandwich, it looks very delicious” (Autonomous Systems and Biomechatronics Laboratory, 2013, 1:00; 4:04).

Similar to the robot Brian™, the available descriptive literature would indicate that Casper™ cannot provide verbal interactions to a user outside of the kitchen scripts it has been programmed with. Put another way, it is unclear whether the robot would be able to say any interactive phrases in response to the user saying or doing anything unrelated to the singular task it had been programmed to complete. Moro, Nejat and Mihailidis (2018) noted in their study that during a tea-making exercise, while users were waiting for the kettle to boil, Casper was programmed to ask three social questions including “(1) How are you doing today? (2) How is the weather outside? and (3) What do you have planned this afternoon?” (p. 20, 21), but once the water had boiled, the robot resumed the typical coaching prompts that led the user through the tea-making exercise until completion. Importantly, I must reiterate that the concern here is not these models fail to be useful caring tools because they are not ‘human enough. Rather these approximate appearances of human beings, in both physicality and emotional affect, are not substantial enough to establish the moral exchange and connectedness that (in part) define good caring relations.

Finally, the German-designed Care-O-Bot™ is another model of personal assistive robot intended to help provide care services to an aging population. Schraft, Schaeffer, and May (1998) assert, like other SAR developers, that the Care-O-Bot™ functions as one of many “supporting technological solutions” (p. 2476) for older adults wanting to maintain independence later in life. There have been several iterations of the Care-O-Bot™ (the most recent being the Care-O-Bot 4 ™, see Figure 1, C). Like the previously described models, the Care-O-Bot™ also roughly resembles a human being with two arms positioned on a ‘torso’ and an emotive digital ‘face’. The Care-O-Bot™ was designed to provide a broad range of supports to human beings in a domestic environment, including being a handling aid/executing fetch and carry tasks, technical house management (e.g. control of home infrastructure like heating, air conditioning) and personal management (e.g. medication reminders, facilitating daily routines) (Fraunhofer IPA, 2016; Reiser et. al., 2013; Schraft, Schaeffer & May, 1998).

Interestingly, a recently published article examining the implementation of the Care-O-Bot™ for use amongst older adults noted that its developers were working to change its existing response patterns by “making the obedience of the robot less absolute” (Sorell & Draper, 2014, p. 189). Developers intended to make it such that the robot’s face is even more emotionally responsive to the user to maintain social skills. For example, if the user is behaving in a manner deemed overly insistent or impatient with its demands of the robot, Care-O-Bot™ will make a displeased ‘face’, or a pleased one if the user is regarded as acting cooperatively (Sorell & Draper, 2014).

It is essential to this project to consider how the features and design of this category of robot are discussed in the descriptive literature. SARs are described by their developers as assistive companions for older adults. Consequently, it is important to scrutinize descriptions of their abilities to determine whether they are truly useful care tools that can ameliorate the gaps in care resources for aging persons. I agree with the perspective of Sparrow and Sparrow (2006) who argue that much of the descriptive literature written by SAR developers overstates the actual caring capacities such robots possess. They assert that “discussions of human-robot interactions, or the higher-order properties of robots, are plagued by equivocations about how genuine the properties attributed to robots are” (Sparrow & Sparrow, 2006, p. 153). They argue that robot developers’ choice of language implies the presence of genuine emotion or thought which overstates the actual capabilities that robots have.

Of course, Brian™ is not actually making emotional expressions of sadness or happiness during interactions but relies instead on limited "facial muscle system" and an algorithmic "emotional state module" (McColl, Louie, & Nejat, 2013, p. 76; Chan & Nejat, 2012, p. 2) programmed to replicate a prototypical expression of human happiness or sadness. When Brian's™ developers McColl, Louie, & Nejat (2013) describe Brian™ as "capable of displaying emotions" (p. 76), this is language that anthropomorphizes the robot's design. Likewise, when the Casper™ robot says to its user that it has a favorite food, this is to project a non-existent quality onto the technology, as we know robots do not eat. While these may appear to be mere semantic distinctions, I would argue that our descriptive language implies something about the status of the thing being described. Consequently, to use language that implies the presence of genuine emotion or thought overstates the actual capabilities that these kinds of robots have.

Importantly, it is not that SARs are not useful because they fail to meet the standard of being caring humans, rather, it is that they are being marketed as being human-like, when in fact they are no different from other care tools. To act otherwise encourages assigning these tools a moral agency that they will never possess. Caring well relies upon capacities inherently reciprocal and responsive in nature, which ultimately precludes socially assistive robots from being useful caring tools in meeting the complex psycho-social care needs of older adults.Certainly, SAR developers are not proposing that SARs are able to meet every single care need of an older adult user, but rather focus on the realm of social and cognitive care needs. With that said, I will demonstrate in the following chapters that to describe or assign sophisticated psycho-social skills to this technology risks the care needs of aging persons being reduced to the degree and quality of 'care' that SARS are capable of delivering. I argue that unconsidered and protracted use of this category of robot removes opportunities for older adults to communicate their evolving care needs to their caregivers. In short, SARs are not suited to meet the goals and values that define successful and useful caring relationships, particularly with respect to the unique care needs of an aging population.

The function of this chapter was to attend to the descriptions and uses for SARs in closer detail. In explicating select examples of SAR models, I established how they are distinct from other categories of assistive robots because of their human-like physical designs, and various speech scripts that create an interactive aspect to the user experience. I further located this category of robot as a proposed care tool to assist an older adult user with various kinds of daily living tasks. Additionally, I introduced the critique of these robots as having overstated capabilities as assistive ‘companions’ for older adults. The following chapter will define the theoretical framework I am using, care ethics. By drawing on the works of scholars of care ethics, in addition to thinkers from the disciplines of medicine, nursing and philosophy, I will define care and caring activities, and illustrate that care ought to be understood as a reflexive moral activity that requires specific capacities to be completed well. In defining these caring capabilities, I will be able to demonstrate how assistive care robots are unable to participate in care, where care is understood as a reflexive moral activity. I argue that in defining care in this way, we can understand when a standard of care has not been met. Consequently, I will demonstrate how SARs cannot participate in the kind of moral exchange that is as essential to useful and effective caring relations as the completion of instrumental care tasks.

Chapter Three: Theoretical Framework

Gadamer (1996), in his philosophical commentary on the practice of medicine in a modern technological age, wrote that the art of medicine is nebulous to define, as it begins in a "particular kind of doing and making which produces nothing of its own and has no material of its own to produce something from" (p. 34). Similarly, 'caring' more broadly has no easily analyzed final 'product'. Characterizing what we count as care is difficult, as there has historically been little consensus on what we are referring to when we talk about 'care'. Do we mean caring in a strictly emotional sense, like when we say, 'I care about you'? Should caring also be thought of as a set of caring activities? If so, what activities and tasks count as caring ones? Scholars of care ethics, a stream of moral theory that asserts "there is moral significance in the fundamental elements of [our] relationships and dependencies" (Sander-Staudt, 2021, para. 1), have historically been concerned with the task of defining care. Some thinkers have proceeded on the "tacit understanding that…we know what we are talking about when we speak of taking care of a child or providing care for the ill" (Held, 2006, p. 29). However, it is only by defining care that we can understand when the term has been appropriately applied and recognize which of our caring practices are ethical and authentic. Moreover, with this concept of ethical and comprehensive care established, we can subsequently determine when a standard of care has not been met with the use of socially assistive robotics (SARs) technology.

In short, this chapter aims to provide evidence for the idea that in order to recognize and understand the limitations of SARs, we need to more closely examine the dynamic they are being inserted into: the care relationship. By more closely examining the relationship of the caregiver and care-receiver, I will address how participating in such a relationship brings certain ethical obligations (in this case, the obligation to care well). In view of this more nuanced understanding of what is required to care well, I provide evidence for the argument that SARs are not useful caring tools.

3.1 What care ethics brings to an analysis of SARs technology

There are many streams of moral and ethical theory that could be used to examine the use of SARs with older adults. However, as I articulated earlier, engaging a care ethics lens to examine this issue allows for a novel analysis of assistive technologies. Recall from Chapter One that care ethics is the stream of ethical theory where care is the foundation of morality, making the various relationships and dependencies where we provide care to one another morally significant (Sander-Staudt, 2021). Historically care ethics has been concerned with the care relationship as defined by the participation of a human caregiver and a human care-receiver. Care ethics scholar Nel Noddings posited that caring is “ontologically basic to humanity” (Burton & Dunn, 2013, para. 2) where our identities are founded on our relationships with others and how we care and are cared for in return. And undoubtedly, most readers will likely already recognize that a robot has much more limited capacities for communication and other skills than a human caregiver. However, SARs technology is unique from other kinds of assistive technologies in that its use (both in the sense of the spaces they are being inserted into, and the tasks they are designed to execute) has been definitively advertised as being able to support or otherwise carry out caring tasks. Consequently, I argue that this technology ought to be critically evaluated to confirm whether the technology is actually helping the older adult users. While the needs of the end user, the older adult, is my main concern for this project, determining the efficacy and usefulness of this technology is also pertinent in the broader conversation about allocating resources to address the gap in care needs for this population.

Demonstrating that SARs ought to be critically evaluated in this way first requires a more comprehensive description of what good care actually is. By referencing key works of care ethics scholars, including Virginia Held (2006) and Joan Tronto (1993), I will demonstrate that authentic care is understood as more than simply completing individual caring duties or activities. Good care also recognizes the necessity for care practices to be evaluated and improved upon, and that the caregiver must also recognize and affirm the deeper existential needs of the care-receiver. First, I will attend to a discussion of defining caring tasks, otherwise known as care labour. In doing so, I provide support for the argument that SARs participate in and execute activities and tasks that belong to the realm of care labour.

3.2 The Range and Nature of Caring Tasks

The task of describing and defining what constitutes a caring activity has been historically challenging to care ethics scholars because of the wide variety of tasks we can think of as caring or helpful. Many care activities are, on a surface level, very distinct from one another. Consequently, it is not always easy to recognize what counts as care work. Moreover, the variety of care practices also challenged care scholars to describe what commonality exists between all kinds of caring practices. Virginia Held (2006) writes:

> Dressing a wound so that it will not become infected is not much like putting up curtains to make a room attractive and private. Neither are much like arranging for food aid to be delivered to families who need it half a world away. Yet all care involves attentiveness, sensitivity and responding to needs. (p. 39)

Consequently, an activity or practice counts as a caring one if it addresses and fills a need. However, a further important observation from Held’s commentary is that she describes qualities that facilitate the recognition and fulfilment of needs. Undoubtedly, we sense there is a distinction between how needs are met. A need being fulfilled in such a way that, for example, also affirms and acknowledges the humanity of the care-recipient, versus having a need fulfilled in such a way that makes the care-recipient feel burdensome or otherwise ignores the complexities of a person's health or identity bring about different ends. What a practice of ethical caring recognizes is that the means used to bring about a particular end are just as significant as the end itself. I will return to this idea in more detail later in this chapter.

I argue that SARs participate in care work because the tasks and interactions they have been designed to execute were created to meet at least some of the needs of an older adult user. Recall from Chapter 2 where I noted that SARs have been designed to assist with, or execute a variety of daily living tasks, including but not limited to, assistance with the preparation of meals, reminders to take medications, and social stimulation by way of playing card games. Considering Held's description of caring tasks as being that labour which recognizes and fulfils a need, I argue that SARs participate in care work. Joan Tronto articulates a similar definition of care to Held, describing it as a process that "… seems to involve taking the concerns and needs of the other as the basis for action" (1993, p. 105). While it may be that it is their developers that are the ones recognizing the needs of the aging user, the robot itself is nonetheless an active 'participant' in seeing needs will be fulfilled. SARs are programmed to function independently of their developers, in the sense that they are not remotely operated or otherwise receiving input from developers in real-time in a care scenario. This is why the robots themselves are the object of this ethical analysis and not the developers, though their relationship to technology and conceptualizations of care are also extremely important.

It is not a revelatory observation to argue that SARs participate in care labour. However, as I have so far hinted at, good care is more than the completion of singular care activities. Consequently, to continue a fruitful analysis of this technology, we must examine what conditions a care ethics framework imposes on the completion of care work. In the following sections of this chapter, I provide a discussion of these conditions. Having established what practices and circumstances allow for authentic care, the following final chapter will discuss why it is that the ability of SARs to participate in singular caring tasks does not necessarily make them a useful caring tool.

3.3 Care as a Practice and a Value

It is essential to define care as more than labour. Virginia Held (2006) writes "Care is surely a form of labor, but it is also much more…. the labor of care is already relational and for the most part cannot be replaced by machines in the way so much other labor can" (p. 38). Held also argues that that care should not be thought of as a set of individual actions or behaviors but rather a "practice that *develops*" (p. 42). She describes caring as a moral activity with "attributes and standards" (Held, 2006, p. 42) such that we can judge when the provision of care is merely adequate from when it is truly good. Moreover, she also writes that care ought to be thought of as a value in and of itself to be used to "pick out the appropriate clusters of moral considerations, such as sensitivity, trust and mutual concerns" to evaluate care activities on whether they are morally deficient (Held, 2006, p. 38). Held mentions early on in her work "The Ethics of Care: Personal Political and Global" (2006) that care without an ethical framework can too easily veer into practices that are harmful or domineering. Moreover, she asserts that "the various aspects and expressions of care and caring relations need to be subjected to moral scrutiny and *evaluated* [emphasis author's own], not just observed and described" (Held, 2006, p. 11).

To describe care in this way is not to reduce it to a subjective emotional state. There is an undoubted difference between 'taking caring of' someone in the sense of the real and material practice of engaging in care activities, and in 'caring for' someone. The latter more typically encompasses those kinds of emotions of warmth, love or concern we have about people who are important to us[6]. Held affirms as much, noting that our exchange of common expressions like 'take care' illustrate "human relatedness and the daily reaffirmations of connection" (p. 30).

However, not all care is good care: where does our description so far leave us in determining what constitutes 'good' care? 'Good' and 'bad' are certainly imprecise descriptions when not further qualified. Similarly, our understanding of care labour needs further contextualization within a care ethics framework. We may distinguish rather easily that taking 'care of' someone is not the same as 'caring for' (in the sense of having warm or affectionate feelings) them, however, "whether certain feelings must accompany the labor of care is more in doubt" (Held, 2006, p. 30). Here is where a return to a more fruitful description of caring capacities becomes useful. Held recognized this as well, writing:

> If we say of someone that ''he is a caring person,'' this includes an evaluation that he has a characteristic that, other things being equal, is morally admirable. Attributing a virtue to someone, as when we say that she is

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[6] A note on language; I use 'care', 'caring', 'care work' and 'care labour' somewhat interchangeably throughout this thesis. Importantly, especially for the later chapters, I do not use 'caring' in reference to SARs (e.g. 'SARs participating in caring tasks") to imply that I believe there is some realized sense of moral agency present in this technology. This point will be returned with greater detail later in the thesis, however, it is essential that the reader understand in some sections the tense of the language in which I present my arguments and perspective somewhat unavoidably introduces language that can be interpreted a number of ways.

> generous or trustworthy, describes a disposition but also makes a normative judgment. It is highly useful to be able to characterize people (and societies) in specific and subtle ways, recognizing the elements of our claims that are empirically descriptive and those that are normative. The subtlety needs to be available not only at the level of the descriptive but also within our moral evaluations. ‘‘Caring’’ thus picks out a more specific value to be found in persons’ and societies’ characteristics than merely finding them to be good or bad, or morally admirable or not, on the whole. But we may resist reducing care to a virtue if by that we refer only to the dispositions of individual persons, since caring is so much a matter of the relations between them. We value caring persons in caring relations. (p. 38)

Thus, caring well relies upon some deeper qualities possessed by the caregiver. Furthermore, in respect to care labour, Held’s perspective adds compelling support to the argument that care labour necessarily requires a particular kind of caring disposition. In the above quote, Held articulates ‘caring’ to be more than a general descriptor for persons and societies but a virtue and practice that is valuable only to the extent that it grounds itself in the relational aspects of caring. Here is the essential tension I wish to emphasize in this chapter: Held’s perspective is also applicable when we focus on the notion of care labour. This nuance is important because in considering care as a practice, and if care as a practice necessarily involves care labour, it should follow that the provision of care labour must necessarily involve the relational aspects of caring if the labour is to be done well. Put another way, care labour in the absence of care as a value that necessarily guides and informs our caring relations is not enough to meet the care needs of older adults. I will return to this argument in more detail in Chapter Four.

In the following section I further unpack the idea of caring capacities by looking at Joan Tronto's construction of the elements of care.

3.4 Caring Capabilities

Tronto also provides a description of care that understands care as both a practice and a value. Tronto (along with Bernice Fisher) defines care as a type of practice: "[care is] a species activity that includes everything that we do to maintain, continue and repair our 'world' so that we can live in it as well as possible" (Tronto, 1993, p. 103; Fisher & Tronto, 1990). Tronto provides this definition with the caveat that one must not reduce care to just a particular set of practices, or one type of process. Care is more than a singular moral trait or virtue and instead represents "active humans engaged in the processes of everyday living.... *care is both a practice and a disposition*." (Tronto, 1993, p. 105).

Recognizing the unpredictable and shifting nature of the care dynamic and the persons in it is also crucial for creating an encompassing understanding of care. Tronto notes that the injunction to care does not mean caring at the expense of all our other moral axioms. Rather, it is precisely because caring bumps up against other moral tenets like 'do not lie' or 'do not harm others', that a set of keen caring capacities is important. Given that so many features of care (e.g., the natures of the caregiver and care-receiver, the literal physical site where care occurs, the needs of the care-receiver, etc.) are almost always in flux, Tronto argues that no one moral rule or set of principles is generally useful to the caregiver. Instead, Tronto posits the idea that good caregivers ought to have (and continually work to improve upon) the kinds of qualities that allow them to make judgments about the features of care that are so often in flux.

Tronto further illustrates this in her description of the elements of care: *attentiveness*, which involves recognizing the needs of others; *responsibility*, understood as having more than a mere obligation towards another; *competency*, which is carrying out caring acts correctly and effectively, and, *responsiveness*, which is being aware of the care receiver's own perceptions and evolving needs.

Attentiveness is described by Tronto as the capacity for attention, which she contends is an essential foundation for care. Simply put, a care need can be fulfilled if it goes unseen. Tronto posits that "an ethic of care would treat ignoring others — ignorance — as a form of moral evil" (1993, p. 127). She allows for a distinction between wilfully ignoring a need and failing to be aware of a need, arguing that "simply recognizing the needs of those around us, is a difficult task" (1993, p. 127). Tronto argues that supporting caring attentiveness is in part a social matter, in that we need to look to our day-to-day life to determine what barriers exist to establishing the moral foundation that other people, and their needs, ought to matter.

The care element of responsibility asks that caregivers reflect on what we may owe or otherwise feel beholden to others, as the basis for action. Tronto is careful to note that responsibility should not be reduced to formal or contractual agreements or professional obligations, arguing that often "our responsibilities are conceived formally as the need to conform to obligations" (1993, p. 131). Responsibility conceived in this way is too rigid according to Tronto, and she notes that having a flexible understanding of what counts as responsibility allows us to look across many different spheres of life (including individual familial relationships, our political and governing systems, and our social communities) and understand that there are many conditions where we may become aware of a need for care. Tronto contends that ultimately, responsibility may be understood as the recognition that "something we did or did not do has contributed to the needs for care, and so we must care" (1993, p. 132).

The care element of competency mandates that caregivers ensure that care needs have been adequately addressed. Tronto argues that "making certain that the caring work is done competently must be a moral aspect of care if the adequacy of the care given is to be a measure of the success of care" (1993, p. 133). Furthermore, Tronto points out that to *not* include a notion of competency in ethical caring allows sub-par care to be excused on the grounds of good faith, poor resources or other reasons. She articulates an example of a teacher assigned to teach math to students despite not having an educational background to teach math. Tronto notes that while at first it feels wrong to "morally condemn a teacher who does his best" with poor resources, it allows those who assigned the incompetent teacher to feel absolved of their responsibility to ensure that the need (in this example, children learning mathematics) has been fulfilled. In sum, competency requires that we take responsibility for meeting a standard of care. It is not a matter of assigning blame to the teacher in this example, but rather acknowledging that the standard of care in this case (teaching mathematics in a sub-par manner) is not acceptable. Consequently, competency asks that we acknowledge that certain behaviors and actions simply do not meet a particular standard and must be changed if we are to say with some sense of truth that a care need has been fulfilled.

The fourth element of responsiveness acknowledges the importance of understanding the 'other' in a care relationship. Tronto notes that responsiveness is distinct from the element of attentiveness in that responsiveness is asking the caregiver to not just recognize the particular need of a person, but to acknowledge the unique differences and vulnerabilities others have that may act as barriers to having their need(s) met. Responsiveness asks that we work not to understand another’s needs through our own eyes, but rather “that we consider the other's position as that other expresses it” (Tronto, 1993, p. 136). In short, Tronto argues that responsiveness is essential to ethical care because it ensures that we do not treat people as interchangeable. She argues that without responsiveness, we often fail to recognize (and subsequently fail to act accordingly and appropriately) that “all of us go through varying degrees of dependence and independence, of autonomy and vulnerability” (Tronto, 1993, p. 135). It is therefore important to respond to needs in such a way that recognizes how these varying vulnerabilities not only determine how a need can be met, but how they often open us up to abuse in caring relationships.

The four elements related to this definition exist concurrently as goals, stages, or virtuous frames of mind. I believe these elements of care to be especially useful in helping to generate a standard of care with which to evaluate our caring practices. The elements function to reify what an ethical practice of care is by providing qualities generalizable to the wide variety of care practices, in addition to informing what a good and caring “general ‘habit of mind’” (Tronto, 1993, p.127) ought to look like. Tronto also describes a fifth sort-of sub-element, akin to a grounding principle of care, which she calls integrity. She argues that good care “requires that the four phases of the care process must fit together into a whole,” and that this is only achievable by incorporating integrity into the caring process (Tronto, 1993, p.136). One element cannot exist without the other, and in many respects, depending on the care context, these elements will be in conflict. Tronto asserts that care as an ethical practice involves having to make judgments about how to best resolve such potential conflicts between our care values. The injunction that one ought to act with these four elements in their practice of caring does not itself describe to what that injunction amounts. Tronto subsequently describes what I believe is a sort of moral discernment in the practice of caring:

> Care as a practice involves more than simply good intentions. It requires a deep and thoughtful knowledge of the situation, and of all of the actors' situations, needs and competencies. To use the care ethic requires a knowledge of the context of the care process. Those who engage in a care process must make judgments: judgments about needs, conflicting needs, strategies for achieving ends, the responsiveness of care-receivers, and so forth. (1993, p.136-137)

It is only when a caregiver incorporates these kinds of thoughtful moral judgments that we can say that care is done with integrity. Furthermore, we may also say that good care requires that we integrate the broader social, political, and personal contexts in which caring exists to truly understand the needs that we are to meet. To reiterate, care ethics scholarship understands care as more than simply completing individual caring duties or activities. Certainly, these tasks partly define care, but even more so, good care is about the ability of the caregiver to use the practice of caring activities to evolve into a better caregiver for the future. The elements of care allow a caregiver to treat the caring scenario holistically and make thoughtful considerations about conflicting care needs, practical constraints, and the care receiver as an individual with a unique history and disposition. Good caregivers can discern variations in vulnerability, whether that be from things like physical decline, or isolation due to a difference in sexuality or ethnic background and incorporate this into their caring approach. In the following sections, I contextualize this description of care and caring capabilities within other scholarly work on care. First, I illustrate how good care can only be realized in a relationship that incorporates a sense of mutual exchange and intersubjectivity. Secondly, I discuss how good care is also a site for both the caregiver and care-receiver to affirm one another's humanity, and why that is an essential component of comprehensive care.

3.5 A Further Exploration of the Care Dynamic

So far, I have explored care ethics scholarship to define care as a developing practice, value, and a process that relies upon certain capabilities to be done well. However, there is another feature of the care relationship that is essential in a discussion of assistive technologies and their capacity to be useful caring tools, and that is the intersubjective nature of such relationships. Scholarly work examining the concept of intersubjectivity argues that "it is the core of [our] interpersonal relationships" (Ollagnier-Beldame & Cazemajou, 2019, p. 405). Intersubjectivity can be understood as "a shared emotional, linguistic, perceptual or cognitive meaning or understanding of any given situation" (Hodge et al., 2020, p. 2). Incorporating an explicit discussion of intersubjectivity within our intimate relationships, particularly our care relationships, is useful because it serves as a reminder that many of the ends we seek in our care relationships are only possible through a relational exchange.

3.5.1 The Inherent Intersubjectivity of Caring

Many, if not all, of the goals hoped to be achieved through ethical caring practices cannot be achieved in isolation. Care ethics scholarship understands persons exist in an "embodied nexus of relations" (Held, 2006, p. 48) and that good care relies upon a sense of mutuality within this nexus. This is the case not only in the literal sense that communicating about one's needs or possible barriers to care is required to take caring action, but in some sense recognizing that this kind of relationship, one built on mutual exchange, surpasses the kind and quality of care work a person could achieve on their own. Moreover, to try and care without this kind of exchange risks a paternalistic approach to caring, wherein the kinds of capabilities and values required to care well (like Tronto's elements of care discussed earlier) cannot be upheld, because the needs and experiences of the other have become obscured.

Furthermore, failing to see the care relationship as a site of mutual exchange ignores the way the care dynamic is beneficial for the caregiver as well. Arthur Kleinman (2012) writes:

> "... caregiving centres on a different kind of reciprocity than financial exchanges— albeit it can be both. It is closer to gift giving and receiving among people whose relationships really matter. The person receiving care shares her experience and story as a gift with the caregiver, in reciprocation for the practical things that need doing along with a sensibility akin to love. *What is exchanged is the moral responsibility, emotional sensibility, and social capital of the relationship*. The exchange changes the subjectivity of both the caregiver and the person receiving care. The terms "taking care" and "caring" imply cultivation of the person and the relationship through practices of attending, enacting, supporting, and collaborating. What is at stake is doing good, for others and for oneself, if need be, despite the emotional and material cost. Indeed, the rewards— unvoiced or explicit—can be transformative, going to the heart of who we are and what we can offer, or endure" (p. 1551).

Put another way, while the care-receiver may be the party that more readily springs to mind when considering the benefits and harms that emerge from a care relationship, the caregiver is also changed by and benefits from participating in caring. Providing care for another person, someone with the same physical and psychological vulnerabilities as oneself "resonates with the most troubling preoccupations of both carer and sufferer about living, about self, and about dignity" (Kleinman, 2012, p. 1551). When caring is done well it "builds trust and mutual concern and connectedness between persons" (Held, 2006, p. 42). Not only is this to the benefit of the end goals of the relationship (e.g., a higher degree of trust means that the care-receiver is more likely to be able to communicate their care needs to their caregiver), but it also represents a good in and of itself. Vallor (2011) argues as much, contending that much of the ethical literature on the use of assistive robots places little emphasis on the notion that caregivers benefit from engaging in caring practices:

> "If there are goods internal to the practice of caring, then I am surrendering these goods if I give up the practice [of caring], and this holds true whether or not I have interactions with the robot to whom I have surrendered it to" (p. 256)

What Vallor posits in the above quote is that often the discussions of the harms and benefits that may occur in caring relations often over-emphasis the experience of the one being cared for. Her argument, like Kleinman's, reminds us that we cannot " leave behind the question of what we may do to ourselves when we choose to surrender caring practices to robots" (Vallor, 2011, p. 256)

In light of these perspectives, I argue that participating in a relationship built on qualities like trust, mutual understanding and respect, and kindness is beneficial for both the caregiver and care-receiver, in that it provides the opportunity to be seen and heard by another human being. In the following section I unpack this idea of human-to-human relations in more detail by attending to the idea of moral presence, and why it is important to our caring relations.

3.5.2 Care and Moral Presence

Good caring relations must also acknowledge and address care needs that go beyond the easily recognizable kinds like hunger and thirst, but also include those of the psycho-social kind. I believe it is essential to have a comprehensive understanding of care that is not restricted to what we traditionally understand as medically essential to the body. Recall at the beginning of the chapter where I discussed Held's (2006) description of the breadth of caring tasks, including the example of "putting up curtains to make a room attractive and private" (p. 39). The act of putting up curtains in a hospital room does not intervene upon the person in the hospital in any kind of physiological or medical sense of care, but it can be understood as care in that it makes the person's hospital room feel less dingy or clinical. By making this hypothetical person feel more at home in their hospital room, perhaps they are more relaxed and receptive towards their hospitalization and treatments in general. This is but one example; however, the same idea is present in all activities that may not be part of any physiological or psychological intervention in a truly medical sense but are in fact opportunities to preserve a person's overall wellness.

Caring relationships are an opportunity for human beings to provide moral solidarity to one another. Arthur Kleinman argues that the care relationship is a site for this kind of existential support. He argues that caregivers can provide practical care in such a way that emphasizes the "human [of the caregiver] as well as their technical aspects [and skills]" (Kleinman, 2012, p.1550). Kleinman also makes an essential observation that acknowledging the personhood of the one receiving care requires attention to what he calls the core tasks of the care relationship, including “the laying on of hands, empathetic witness, listening to the illness narrative, and providing moral solidarity through sustained engagement and responsibility over the course of chronic illness” (2012, p. 1551). This creates what Kleinman calls a sort of moral ‘presence’ that becomes especially important when curative options have been exhausted. I will return to this concept in the following chapter, in order to discuss how current scholarly descriptions of SARs as possessing this kind of moral presence are fundamentally incorrect and rely on a weak standard for moral presence.

In sum, this chapter sought to lay down an ethical framework from which to critically examine the use of SARs with older adults. By referencing the works of the scholars of care, I conclude that care is both a practice and value, and relies upon the cultivation and refinement of certain capabilities in order to do well. Moreover, I have discussed why including a conceptualization of intersubjectivity in our caring relations ensures that we recognize authentic relationships as requiring mutual exchange between persons. I also discussed the concept of moral presence and how it ought to be recognized as a goal of good caring relationships. In the following final chapter, I discuss the arguments and evidence presented thus far to argue why SARs are precluded from being useful caring tools. I also discuss how the interest in implementing this kind of assistive technology does not adequately uphold the values of care that ought to be present in our approaches to create interventions for healthy aging and discuss alternatives interventions and programs for aging persons.

Chapter Four: Ethical Analysis

In light of the definition of care articulated in the preceding chapter, this final chapter will now examine and establish good reasons for why we should not categorize socially assistive robots as useful care tools. In what follows, I will appeal to the limited nature of the pre-programed scripts and scenarios of the robots described in Chapter 2. By contrasting the reality of SARs' lack of true communicative skills against the caring capabilities discussed in care ethics scholarship, I create a foundation from which to evaluate the limitations of this technology as a proposed care intervention. I argue that any possible advantages gained from implementing this technology are outweighed by its limitations. Furthermore, I will contrast SARs against proposed alternatives to traditional models of aging care to demonstrate that there are solutions for an aging care crisis that better incorporate the kinds of values that support a person-centered vision for healthy and successful aging. First, it is necessary to return to a discussion of the needs of aging persons. In the following section, I illustrate the complex psychosocial needs of older adults to establish the disconnect between SARs' actual capacities and their ability to meet these needs.

4.1 Further Discussion of the Care Needs of Older Adults

In Chapter One, I discussed several barriers to comprehensive and healthy aging. However in order to have a more fruitful discussion about the limitations of SARs technology, it is essential to create a more nuanced understanding of the kinds of needs aging persons experience. Importantly, the purpose of this section is not to gloss over the categories of needs that are more focused on physical care (e.g., management of chronic conditions, approaches to managing medications, etc.) but rather to focus on the kind of need SAR developers assert their technology assists with. Given that SAR developers have presented socially assistive robots as being just that, *socially* assistive, this ethical analysis requires that we first determine the psycho-social needs of aging persons.

Loneliness and social isolation are high on the list of concerns for aging persons. Barbosa-Neves, Sanders and Kokanović (2019) determined in their six-month qualitative study that these issues are quite complex and are definitively impacted by contextual factors including "rules and expectations about social interaction and emotional display in later life; a lack of opportunities to discuss loneliness or isolation in their living settings; and the stigmatization of these experiences" (p. 82). Their study participants, residents from two care homes, articulated strong feelings of isolation "due to lack of friends [who did not reside in the home with them or had recently died] and [having few] opportunities to make new acquaintances" (Neves, Sanders & Kokanović, 2019, p. 78). Similarly, many seniors who remain living independently also struggle with social connectedness. While remaining in one's community and home is often posed as a better alternative to living in a care institution, many seniors still experience a high degree of social isolation and loneliness. Many aging persons outlive spouses and other family members, and end up living alone, becoming removed from their support structures and social networks (British Columbia's Children's, Women's, and Seniors Health Branch, 2004). Moreover, the incidence of social isolation and loneliness increases for LGBTQIA+ seniors, elderly immigrants, and for older adults who experience some form of disability (Emerson et al., 2021; Center for Disease Control and Prevention, 2021).

The incidence and experience of social isolation and loneliness also impacts the quality of one's physical health. Wilkinson and Marmot (2003) note that social isolation and exclusion are associated with "increased rate of premature death … less well-being, more depression

…[and a] higher level of disability from chronic diseases” (p. 22). Moreover, older adults who struggle with social isolation and loneliness are more are more likely to experience dementia (Holwerda et al., 2014), chronic pain issues (Jaremka et al., 2014; Smith, 2017), physical frailty (Gale, Westbury, & Cooper, 2017), and a variety of terminal illnesses (Chan et al., 2015; Tilvis et al., 2012). Consequently, the experience of concurrent physical and cognitive decline results in changed/increased care needs, as well as the experience of new barriers to social participation. One participant in a study by Paque and colleagues (2018) articulated this phenomenon when reflecting on their experience of loneliness after transitioning to a care home:

> ‘Loneliness? I don’t know. Why am I feeling lonely? Because I’m alone. I always say I’m all alone. I can’t see. And I can’t do anything. I can’t do anything anymore. Because of my hand, I can’t do anything with my hand. I wrote a postcard to someone yesterday, I wrote one word, and the second word ... I started writing the second word over the first word ... because I can’t see properly. That’s really annoying, you see’ (woman, 91 years, [nursing home] ‘Z’). (p. 1479)

This participant’s response lends support to the idea that the experience of loneliness and isolation for older adults can be considered unique in that physical declines and changes in functional autonomy may impair one’s ability to alleviate these feelings on their own.

Older adults report that social engagement and support is incredibly important to their conceptualizations of successful aging. In a study on the importance of peer relationships to thriving while living in a care home, Bergland and Kirkevold (2008) found that close relationships with peers and caregivers were reported to promote “social support, opportunities for mutual exchange of positive and negative thoughts, experiences and goods” (p. 1299). Cook and Stanley (2009) reported in their study examining what factors contribute to quality of life in residential care that the process of moving to a care institution is often incredibly challenging for older adults, as they often struggle with creating meaningful lives within a space that relies heavily on predetermined routines and structure. Participants in the study noted that "personal attributes and abilities, such as hearing, vision, speech, mobility and cognitive ability, restricted their interaction and limited the possibility of fostering friendships and identifying common interests" with staff and other residents (Cook & Stanley, 2009, p. 401). Paque and colleagues (2018) noted that their participants articulated an existential component to their loneliness, reporting that "living in a NH [nursing home] … [feels like] 'leading a meaningless life'" (p. 1481). Sundström and colleagues (2018) note that this kind of 'existential loneliness' is quite prevalent among older adults given that they are at a higher likelihood for experiencing the kinds of significant life changes (e.g., frequent/clustered interpersonal losses, learning to cope with their own physical and cognitive declines, etc.) that require psycho-social supports.

In sum, this section has established that social connectedness is highly important to older adults, but that there are a number of barriers related to alleviating the issues of social isolation and loneliness. The following section now turns to a more in-depth critique of the capabilities of SARs with respect to their ability to meet the psycho-social needs of an aging user.

4.2 Reiterating the Limitations of SARs as Amoral Agents in Care Scenarios

While SAR developers have rightly recognized that older adults need novel interventions to address their psycho-social health needs, I argue that SARs are not useful tools to address the breadth and complexities of these needs. In the following sections, I will demonstrate how the SAR models described in this thesis do not have any truly substantial capacity for reciprocal listening or communication. Consequently, advertising this technology as a way to help meet the social and cognitive needs of older adult users relies on a fundamentally flawed understanding of how complex these care needs are, and presumes that they can and should occur in the absence of moral presence. To that end, I argue that assistive care robots fail to meet the standard of care implicit in defining caring as a reflexive moral activity, and they do not possess the capabilities inherent to the elements of care discussed in the preceding chapter. In the following subsections I return in more detail to Tronto's (1993) conceptualizations of the elements of care in order to demonstrate how SARs technology fails to uphold the values that ought to be inherent to a cohesive and authentic practice of care. Here I would like to reiterate the argument that I introduced in Chapter 1, which is that the limitations of this technology do not lie with its degree of sophistication or 'humanness'. Tronto's framework allows me to illustrate how the growing interest in implementing SARs fundamentally misses the mark in addressing the care needs of aging persons, and is instead indicative of an understanding of care that reduces older adults to the completion of instrumental care tasks. In doing so, I lend support to my overarching argument that the instrumental aspects of care (e.g. the mechanical tasks like washing or feeding someone), done in the absence of the moral presence that is an integral part of caring, is ineffective.

4.2.1 Expanding on Tronto's Elements of Care with Respect to the Use of SARs

SARs have an extremely limited capacity for the reciprocal listening and communication that is integral to a comprehensive and authentic care relationship. In considering the select examples of SARS Brian 2.1™, Casper™ and the Care-O-Bot™ in light of the kinds of caring capacities discussed in Chapter 3, I argue it is impossible to expect that the interactions of SARs with older adults could ever address the complex variety of care needs older adults have in their later years. In what follows, I extend the details of this argument by returning to the elements of care constructed by Tronot (1993) discussed in Chapter 3: attentiveness, responsibility, competency, and responsiveness.

Recall, the first element of care attentiveness calls us to recognize the needs of those around us. SARs are restricted in their communications to the cues (whether they be vocal or physical gestures or button-touchscreen interactions) their developers have integrated into their algorithms. Moreover, SARs are restricted to a particular set of interactions with their user. For example, Brian 2.1™ and Casper™ are not general-use robots, but are limited to certain user scenarios (e.g., pre-programmed recipe selections, one particular card game, etc.). The recognition of needs is not occurring in the robot itself, but by way of its programmers. Should an older adult experience a need outside of one of these pre-programmed scenarios, it is not clear from available descriptive literature that these robots can either address these needs themselves, or signal/contact another caregiver to indicate that a user needs assistance outside of the SAR's scope of practice. Consequently, I argue that outside of these scenarios these robots have poor general usefulness and are not equipped to 'hear' (quite literally) the variety of needs an older adult might have in the run of the day. Tronto posited of attentiveness that it is "probably more morally reprehensible to ignore willfully that which is close to one’s own actions than to fail to be aware of a distant consequence of one’s actions” (Tronto, 1993, p. 129). Interestingly, what I believe to be implicit in Tronto's discussion here is the capacity for being able to distinguish between ignorance and inattentiveness. While both states (ignorance versus a failure to be aware) are morally 'bad' in a caring sense, human beings have some degree of capacity to learn one state from another and rectify their moral behaviors towards a better practice of caring. Robots are unable to do this as they are reliant on their programmers to pre-set them with any form of external communication with a user. They are not free-thinking moral beings; thus, we can say they are unable to be attentive in the truest understanding of the word.

In evaluating SARs against the element of responsibility, it is apparent there is no ability for this technology to act with this capacity in mind. Recall, responsibility is understood as having more than a mere obligation towards another. Similar to the element of attentiveness, a generous view of this technology may allow us to claim that SARs demonstrate some degree of responsibility by way of their developers. However, SARs in their present iterations do not possess an innate or integral capacity themselves to act upon their environment. Rather, we may say that SARs merely extend the capacities of the developers, but as they are ultimately inanimate objects, have no actual sense of responsibility. Moreover, the process of developing and refining the presence of these elements within one's care practice presupposes the possession of a kind of moral discernment to even be aware of such foundational moral measures, let alone how they may best apply to a given situation. Robots are unable to possess any sense of responsibility as they are not sentient beings, and thus have none of the “possible assumption of responsibility [including] political motivations, cultural practices and individual psychology” (Tronto, 1993, p. 132).

SARs also fail to possess and act with the fourth element of care, competence. Despite being programmed to execute a variety of daily living care tasks, it is not evident from the available descriptions of SARs in scholarly literature that the robots possess any kind of evaluative skill set. Recall that Tronto argued that to not include a notion of competency into our understanding of care is to allow sub-par care to be excused on the grounds of good faith, poor resources or other reasons. The outcome of a robot-user interaction is entirely dependent on what likely action-input interactions the robot has been coded (relative to the specific task or tasks it has been designed to assist with) to respond to from the older adult user. Consequently, it appears that the completion of useful interaction like cooking a meal presumes the perfect interacting agent. Given that some models of SARs are intended to be used amongst older adults who may have cognitive impairments from dementia, it remains unestablished that this kind of robot is equipped to handle an emotional outburst or otherwise compromised mental state of an older user.

4.2.1.1. Technology Literacy, SARs and the Complex Care Needs of Aging Persons

An additional ethical dimension related to the use of SARs concerns how older adults have unique considerations when it comes to the practical adopting and operating assistive technologies. Importantly, as similarly emphasized at the outset of Chapter 1, the following arguments are not aimed at the field of robotics engineering as a whole. The success or degree of sophistication in the design of SARs is not the project of this thesis. Rather, my focus is on how older adults' perspectives and responses to SAR technology is indicative of a general trend of under-consultation in developing care supports as a whole. SARs are just one example from the category of assistive technologies that are the focus of this thesis. Consequently, that is why I have narrowed in on scholarly literature with a focus on aging persons' perspectives of SARs. Features of the perspectives discussed herein will certainly be applicable to the design and implementation of assistive devices in general, not just social robotics engineering.

Pino and colleagues (2015) posit the argument that developers who have designed SARs for use amongst especially vulnerable older users have not truly considered the usability of their technology. The following is a response from one of their study participants:

> 'I think persons with dementia will be unable to use the robot. Somebody else would have to do it for him. Otherwise, training must be provided at the first stages of the disease. My husband now has difficulties using the telephone, even if he's used it for over 70 years. How can you expect him to learn to use an appliance that is completely new for him? This is completely utopian.' (Caregiver spouse, 72 y/o). (Pino et al., 2015, p. 7)

Given that we understand human beings to be imperfect creatures, it seems highly unlikely that an older adult user will always react to each step of the scenario in a way that the robot's algorithm can predict, even for users without complex degenerative conditions. Consequently, determining whether a care need has been fulfilled (and therefore done competently) is not possible for SARs as they are reliant on external programming to ensure a successful user-interaction.

Additionally, the language of 'appliance' used by the above participant lends itself to the perspective I have been advocating for throughout this thesis. Namely, that robots are just that: appliances, devices, or an *inanimate* tool. Importantly, the heart of this argument is not critiquing this tool for not possessing the relevant feelings or capacities to be useful in caring relations. Certainly, that robots do not have emotions like human beings do is an obvious statement on its own. Rather, what I endeavour to demonstrate is that a problem emerges when we give a facsimile of human-like qualities to an appliance and then overstate the authenticity and usefulness of those qualities simply because it bears a likeness to another entity with those kinds of skills. By attempting to imbue robots with the kinds of social features I highlighted in Chapter Two, I argue that we veer into trying to turn an assistive device into something with a status higher than that of 'tool' or 'apparatus'. Consequently, my fear is that the complex interpersonal and psycho-social needs of aging persons may become lost or completely unmet with the implementation of this category of assistive robot.

Moreover, the above quote provides insight into the ways in which technological literacy can fall through the cracks when considering the design and implementation of assistive technologies. Lee, Tan, and Šabanović (2016) conducted interviews with older adults between the ages of 57 and 72 for their perspectives on the design and perceived usefulness of assistive robots. After showing participants photos and videos of assistive robots that had been designed with their age group in mind, researchers found that in their responses to the content three overarching themes emerged from participant responses. First, participants shared a concern that SAR developers were not providing adequate consideration of an understanding of "the meaning of robots for older adults" (Lee et al., 2016, p. 316), Second, participants felt as though many of these devices interpreted age through technology as "as a societal problem and deterioration of the individual" (Lee et al., 2016, p. 316). And lastly, a theme of concern regarding the development of assistive robotics technologies that relied on " on generalized images of aging" (Lee et al., 2016, p. 317). These responses demonstrate why "inadequate citizen involvement poses an obstacle during the research, development, and implementation of assistive technology" (Lund et al., 2021).

Furthermore, Vollmer, Dahlke and Ory (2020) argue that the development of this kind of sophisticated assistive technologies presumes a degree of technological literacy in its desired user population. The researchers note that in the literature concerning the factors that impact success in adopting digital technologies, much of the literature relies on smartphone possession as an indicator of successful possession and literacy in using digital technologies. However, Vollmer and colleagues (2020) assert that this approach ignores that cellphone ownership is in itself dependent on socioeconomic status. According to Statistics Canada (2022) the number of seniors living beneath the Low Income Measure (LIM), a common measure of poverty, has increased dramatically since from 4.7% in 2000 to 12.1% in 2017. Despite the fact that technology has become increasingly sophisticated at rapid rates does not necessarily indicate that such technology is universally accessible, both in terms of user-friendliness and material costs. Naturally, critiques of technological literacy as a barrier to assistive robotics acceptance may apply more to certain generations of aging persons more than others. Certainly the current generation of adults who grew up with many more sophisticated pieces of technology from a very early age would have a different experience utilizing assistive technologies as they age. However, the current population of aging persons and their ability to usefully incorporate various technological supports into their lives must be given adequate consideration.

In close, I return to the final element of care for this subsection: responsiveness. In considering this element, we may also critique SARs from being unable to participate in caring relations in a thorough and comprehensive manner. This is not merely an appraisal of their design as responsiveness is more than just vocal communications. Recall, Tronto defines responsiveness as that quality of awareness that allows us to perceive the "conditions of vulnerability and inequality" within our care relationships (Tronto, 1993, p. 134). I do not believe that any model of SAR can comprehend, contextualize, or act upon this element of care. Responsiveness as perception requires an ability to first recognize vulnerability. As reiterated throughout, SAR developers have rightly recognized a rapidly growing need for aging persons, and their caregivers, to have assistance with the completion of instrumental care tasks. However, my concern is how that need is being approached and addressed (whether intentional or not) may be implicitly supporting ageist notions of what older people want and need in their care. There are a number of things at stake for the proposed user of this technology, including a lack of recognition of their emotional pain and cultural variances in a person's experience with care. Responsiveness asks that we consider the unique differences and vulnerabilities others may have that act as barriers to having their needs. Tronto argues that recognizing vulnerability nuances our understanding of one another as human by integrating varying "dimensions of human existence" (Tronto, 1993, p. 135). Arguably, to implement a robot with a lack of perception towards variations in vulnerability, whether that be from physical decline or isolation due to a difference in ethnic background, the experience of being disabled or another form of marginalization/disenfranchisement could be perceived as a harm towards the older adult interacting with it. Moreover, it encourages a monolithic understanding of older adults as a demographic. The ever-evolving and diverse needs of aging persons requires more than a one-size-fits-all approach.

It is also important that we briefly consider Tronto's additional sub-element of integrity. Recall that integrity prompts a care provider to make caring judgements in order to balance the other four elements. As previously discussed, it is likely that in any care scenario, these elements will be in conflict and the needs of an older adult are going to be complex and informed not only by their physiological needs but by their social identity, degree of support, and a myriad of other contributing factors. We know that robots do not operate with higher level thinking and they are not moral/existential beings. Thus, we can say that they are not capable of "deep and thoughtful knowledge of ... [a care] situation" nor do they possess the perceptive qualities to determine a person's "situations, needs and competencies" (Tronto, 1993, p. 136). To advertise them as possessing the ability to do so encourages a standard of care where moral presence is absent from the completion of essential care tasks. As has been reiterated throughout this section, assistive robots are only as 'good' as their programs and algorithms. As the descriptive literature currently stands, it is the case that care robots have very limited communicative abilities and no capacity for the kind of reflexive thinking that can seek to improve care situations either in the present moment, or for future interactions.

In sum, by evaluating the use of SAR against a definition of care that understands caring to be a reflexive, ongoing moral practice that requires certain capabilities in order to care well, I have demonstrated that SARs cannot embody or act upon the elements of care. Consequently, advertising them as being able to provide an essential social presence in older adults' lives may encourage granting them a sense of agency they do not truly possess, the implications of which include diminishing the complex and diverse care needs of older persons, possibly to the detriment of their care as whole. Moreover, I fear their protracted and uncritical implementation encourages an understanding of caring relations that fails to consider how instrumental care tasks are inherently opportunities for crucial moral exchange and solidarity. As discussed in Chapter 3, much of caregiving is not merely about making sure a person has been fed, bathed, or reached a certain level of physical activity, but is about the moral and existential relationship between the caregiver and care-receiver. In the following sections, I address this concept in more detail and argue that even if SARs may participate in care by way of singular care tasks, they cannot participate in care as a moral presence.

4.3 SARs Do Not Possess the Appropriate Level of Existential Presence and Solidarity that is Essential to the Practice of Caring.

Care is a site of mutual exchange and moral solidarity. The nature of our caring relations cannot be abstracted from our experience and understanding of the human condition. Arman and colleagues (2013) posit in their study on caregiving for existential well-being that:

> The vulnerability but also the dignity of a human being is … related in particular to the physical weakness of the body, an aspect to which we must pay continuous attention. Here it is understood that the body is an expression of the being and also the dignity of a person, as it holds that person's entire world and reality. (p. 7)

With that in mind, good care also encompasses and relies on the moral presence of another human being, another entity with the same physical and psychological vulnerabilities as oneself. Arthur Kleinman (1988) contends that much of modern care is in fact not care at all, instead what our healthcare systems construe as care is a biomedical approach concerned with the "technical quest for the control of symptoms" (p. 27) and nothing more. He argues that as much as care is about the practical management of an illness or condition, caregivers must also exist as a "moral witness, neither a judge nor a manipulator… [where the care-receiver] becomes an active colleague, not a passive recipient" (pp. 265-266). Furthermore, the development of appropriate caring skills allows a caregiver to recognize that while the clinical presentation of an illness, or the experience of aging comes with a set of general symptoms, every individual experiences it in a distinct "web of meanings that make sense only in the context of a particular life" (Kleinman, 1988, p 113). The ability to bear witness to this and provide a kind of moral solidarity and presence is especially important when curative options have been exhausted and the care-receiver must confront their own mortality, in what Kleinman calls the "terminal period" (p. 1551).

Defining this sense of moral presence in our caring relations is important to a discussion of SARs because doing so allows us to understand caring tasks as inextricable from a shared sense of the human condition. Even if robotics technology hypothetically advances to a point of sophistication where a robot could possess the sensibilities and capacities to act with some or all of the elements of care discussed in Chapter 3, I would persist in arguing that any protracted implementation of this technology into the lives of older adults would warrant scrutiny. As I also argued in the preceding chapter, caring labour in the absence of care as a value to guide and inform our caring relations is not enough to meet the care needs of older adults. Care as a value recognizes the kinds of "mutual concerns" (Held, 2006, p. 38) shared by human beings as we grapple with what it means to create a meaningful life as our bodies change and degrade and perhaps require more help and assistance than we were previously accustomed to. As indicated in my initial framing of this project in Chapter 2, the critique is not of SARs as an immature technological product, but as a non-human tool/resource being inserted into caring relations where it cannot hope to address the kinds of deeper existential and psychological needs of aging persons.

4.3.1 Caring should not be compartmentalized to individual tasks and activities

Importantly, opportunities to address these kinds of deeper care needs do not just live in the time leading up to a person's death, or in the immediate aftermath of a significant loss or life change. Arman et. al (2013) note that "caregiving is permeated with the insight that the patients' narratives and the caregivers' understanding of it hold the potential for alleviation of the patient's suffering and increased health" (Arman et al., 2013, p. 6) and opportunities for such caregiving emerges in many surprising ways. Arman and colleagues (2013) noted that typically mundane and routine interactions create spaces for openness between caregiver and care-receiver, wherein opportunities for deeper nurturing can occur. In their research, such opportunities included requests for bathing, for the caregiver to make a patient's bed, and the application of an ointment compress to an injury. Patients in their study used these interactions to reveal psychologically and arguably morally relevant information regarding their healing, such as concerns for their family if they should die, difficulties with the pain of their treatments and more obviously existential questions like "'Why me?' [and] 'Is there a God?'" (Arman et al., 2013, p. 6). As mentioned earlier in this chapter, these kinds of deeper questions are especially relevant to older adults dealing with the "physical, mental and social adversities" (van der Vaart & Oudenaarden, 2018, p. 1) of aging. Deaths of friends and family, losses in independence, and declines in health serve to 'reorient' an elderly person to the reality of their aging life and make existential questions like "issues of life and death, our place in this world, [and] what it means to be human" (van der Vaart & Oudenaarden, 2018, p. 1) crucial to finding meaning in day to day living.

Joan Tronto (1998) posited a similar position on care, noting that "concerns about care permeate our daily lives" (p. 16) and that we have good reasons to refocus our discussions of care so that we may expand our ideas of "the 'ethical' to include many of the everyday judgments involved in activities of caring for ourselves and others" (p. 15). Her position is a compelling one as it reifies the idea that the everyday care labour, perhaps mundane and banal on the surface, is inextricable from questions of "how to live a good life" (Tronto, 1998, p. 15). This observation is a key one because in being explicit that there is a complicated range of issues that are relevant to a discussion on ethical caring, we ensure that our ethical frameworks are not just concerned with the kinds of "big questions … [and] impossible dilemmas" (Tronto, 1998, p. 15) that are more easily recognizable as moral issues. Finding and making meaning in our lives can also concern things like the food we eat, the people we hope to see on a daily basis or the clothes we wear. Consequently, a socially assistive robot is of concern for ethical analysis precisely because it is situated within the commonplace tasks and everyday routines of its proposed older adult user.

4.3.2 Robotics technology is not an appropriate facsimile for human connection

Some proponents of SARS have argued that this technology can possess the kind of moral presence that is useful to caring practices. Sorrel and Draper (2014) argue that SARs participate in moral presence by being the "co-location of a thing with a person that brings it about that the person no longer feels alone" (p. 184). Sorell and Draper (2014) also assert that care robots hold a more sophisticated presence by this definition than other things in that category (like stuffed toys or having the television on) because when interacting with human users, SARs are "appearing to take interest in activities in which the older person is engaged … [and] communicating through a touch screen and reacting to the older person's commands" (p.

184). I believe this is a fundamentally weak standard for moral presence. In considering that older persons are often preoccupied with giving meaning to their day-to-day lives, as well as needing support for frequent and ongoing significant life changes, I argue it is reductive to diminish moral presence to merely co-existing in a physical space. Bergland and Kirkevold (2008) noted in their research on how peer relationships impact thriving in nursing homes that "merely sharing physical space did not promote thriving in any of the residents and could even be a threat to the residents' thriving" (p. 1301). If merely sharing space with another human being does not promote well-being, it seems counter-intuitive to believe a robot is an appropriate solution to the psycho-social needs of aging persons.

To contend that assistive robots possess any kind of psychologically, existentially, or emotionally useful presence is, I believe, to degrade our understanding of the needs of older adults as human beings. Sorell and Draper (2014) write that SARs are a presence by being "a subject of interaction – a possible 'conversation' partner and a possible participant in synchronized activity" (p. 190). While the authors do acknowledge the limitations of the communicative abilities of SARs in this paper, this still fundamentally misses out on an essential feature of presence. I return to Kleinman's (2012) understanding of moral presence as a more substantial conceptualization that incorporates an understanding of mutuality. He argues that the care relationship is one rooted in an exchange of "moral responsibility, emotional sensibility and social capital" (p. 1551). I will reiterate the language used by Sorell and Draper (2014) when discussing SARs: this technology is only "*appearing* to take interest' (p.184) and is merely a "*possible* conversation partner" (p. 190). Similarly, recall the tea-making exercise programmed into the Casper™ robot where the robot could ask three social questions ("(1) How are you doing today? (2) How is the weather outside? and (3) What do you have planned this afternoon?"

[Moro, Nejat & Mihailidis, 2018, pgs. 20-21]). While these questions are certainly social in nature, any answer from a user is not being truly received by a party who can answer in a meaningful way. Again, perhaps there will be a day where robotics technology will have developed advanced interactive voice modules that are indistinguishable from human beings. However, the robot will nonetheless remain a pre-programmed entity that cannot contextualize a user's responses to such questions into a broader social and political tapestry, nor respond from a place of shared vulnerability or fear around deeper concerns regarding aging, illness and death. To reiterate, I argue that there is no realized mutuality in a SAR-human interaction and thus I believe we cannot truly say such relationships possess any kind of true moral solidarity or presence that can be therapeutic to its user.

4.4 The Significance of the interest in Using SARs with an Aging Population

By evaluating the use of SARs against a definition of care that understands caring to be a reflexive and ongoing moral practice, I have presented strong reasons why we ought to be wary of the use of SARs with older adults. It is important to note at this point that in discussing caring capabilities, I am not claiming that human beings are infallible agents in care relationships. Of course, not all care is good care. Naturally, as human beings we are complex and intricate and we make mistakes. Moreover, to position human caregivers as a certain means to the end of good care ignores the realities of how individual caregivers are impacted by how care is valued in decision-making spaces like "the institutions in the modern marketplace [and] the corridors of government" (Tronto, 1998, p. 16). The purpose of contrasting the caring capabilities of SARs with those of human carers is to reflect on what underpins authentic and comprehensive care. I argue that assistive robots can only ever hope to participate in one aspect of good care practice: assisting with the completion of singular care tasks. However, I have also argued that caring ought not to be reduced to singular care tasks, and furthermore, caring tasks and activities ought to be understood as opportunities to meet other, deeper human needs. For example, eating is not merely about ensuring a person meets a certain caloric intake for the day, it is also an opportunity for socialization. Similarly, bathing and assistance with personal grooming provide the possibility of comforting physical touch.

Caring activities partly define the practice of care in the sense that there are tasks that we come to typically associate with caring labour. However, good care is also about the ability of the caregiver to carry out these tasks while providing a moral presence for the one being cared for, and working to refine their caring capacities for the future. Consequently, while one could argue that SARs can help carry out tasks that we recognize as part of traditional caring duties, SARs (because they are machines and not human moral agents), do not possess the shared humanity that makes the care relationship a site of solidarity where “the most troubling preoccupations of both carer and sufferer about living, about self, and about dignity” (Kleinman, 2012, p. 1551) can be explored.

4.4.1 The financial and logistical challenges to successfully implementing SARs

There are good reasons to claim that SARs are an inappropriate therapeutic intervention for use amongst older adults, as demonstrated in the previous sections of this chapter. I have argued that by objectively analyzing the design features and subsequent capabilities of SARs, one can conclude, taken together with a more substantial understanding of what constitutes a good practice of caring, that robots are far too limited to provide substantial care to their users. To consider taking a demographic already at risk for social isolation and other psycho-social health concerns like depression, anxiety, and other mood disorders (Reker, 1997) and further removing opportunities for communication and moral solidarity from their fellow human beings, should be at least somewhat ethically concerning.

Moreover, I am wary of counterarguments that contend that the use of SARs is not meant to replace human-based caregiving entirely. This comment is intrinsically related to seeing SARs as a resource-effective care solution for already depleted health systems. I echo the position of Sparrow and Sparrow (2006) in asserting that I am likewise “extremely cynical about the cost savings made possible by robots” (p. 149), in addition to claims that such technologies will not significantly impact the number of human-to-human interactions an older adult may expect to have. Realistically speaking, the provision of care to an aging population is a conversation that relates to the containment of expenditures, where staffing is one of the largest costs. Regardless of the intentions of SAR designers and manufacturers, I believe it would be an uncritical analysis of the use of SARs to not entertain a concern that these robots will be inevitably used to replace, however poorly, human care staff rather than merely supplementing their efforts.

Consider the expenditures for aging care in Ontario as an example. Provincial funding allocated per resident in a long-term care facility is approximately $201.61 per resident, per day (working out to $73,587 per year), and approximately $102.34 of that daily cost must be budgeted for nursing and personal care (such as assistance with personal hygiene, bathing, eating, and toileting) (Ontario Long Term Care Association, 2020). Thus, while healthcare expenditures for seniors have been increasing with the population increase of older adults (approximately 2.8% nationally for Canada), this increase does not account for any inflation or the funding cuts to the healthcare system as a whole (Canadian Health Coalition, 2021).

Accordingly, budgeting expenditures is essential for the survival of remaining LTC facilities. Sparrow and Sparrow (2006) assert that tight budgets within care facilities not only create overburdened staff who have less time to spend providing quality care to individual residents, but also an increase in the rise of care facilities having to justify their spending to the bodies that provide the funding, resulting in "strict limits on the number of hours of help received by frail older people" (p. 150). These trends in the management of care institutions would indicate that it is not unlikely that the use of SARs could be considered to be a viable solution to replace human care workers for LTC facilities in order to maintain internal costs and their precarious position in an increasingly for-profit sector (Pino et al., 2015; Sharkey & Sharkey, 2012; Sparrow & Sparrow, 2006).

That being said, the financial and logistical costs of successfully implementing assistive robots must be considered when examining the long-term efficacy and usefulness of this technology. As noted by Pekkarinen and colleagues (2020), while "there is a growing interest in using robots in care contexts" (p. 10), there are a number of concerns around integrating this technology including "knowledge and education, people's attitudes, ethics and human values, working practices and leadership, governance, regulations, communication and physical integration processes" (p. 10). Similarly, Franke and colleagues (2021) note in their study focusing on the emotions and perspectives towards SAR technology from "employees and leaders within LTCF's [long-term care facilities]" (p. 1) that employees and management have a number of explicit concerns relating to the implementation of assistive robots. Namely, staff and management members are concerned with: addressing technological literacy for themselves and care home residents in learning to use assistive robots; “anxiety, anger, bewilderment and disappointment” (Franke et al., 2021, p. 4) resulting from concerns around job loss and possibility being replaced by an assistive robots; and the potential an assistive robot has to cause distress to residents with more advanced care needs (e.g. “technology-generated overload for sensory and motoric functions (hearing, collision with CAR in the room)” (Franke et al., 2021, p. 4).

Additionally, the reality of the financial cost of assistive robots also begs the questions as to how universally accessible the technology will be for older adult users. Franke and colleagues (2021) note in the illustrative example in their study of the Care Assist Robot™ (CAR) that “the acquisition costs for three CAR amount to [approximately] €28,600” (p.4) (which is approximately equivalent to 39,274.24 Canadian dollars). A question then emerges regarding equal access to this technology. If the majority of these robots are intended for one-to-one user service, how is a hypothetical facility that can only afford only a handful of these robots meant to allocate this technology to its residents? What criteria would be used to determine the need for this robot in a pool of aging persons all requiring assistance with daily living in a care home? Moreover, this hypothetical operates with the presumption that there are enough funds in a facility’s budget to purchase a few of these models. What of the facilities that cannot justify the upfront purchase and subsequent maintenance of these robots? The ethical dimension of access to a health service or good is a substantial project in and of itself that cannot be discussed exhaustively in this thesis, but these questions are nonetheless worth considering even on a surface level.

Similarly, according to SAR developer Dr. Goldie Nejat in an interview with The Globe and Mail (Hewitt, 2010), the SAR model Brian™ discussed in Chapter Two would “cost just over $20,000" (para. 6). Considering that the Canadian government has recently reported that all provincial government spending on long-term care will have to increase by 13.7 billion to continue improving the quality of LTC care, the rationale for implementing SAR technology as a cost-effective measure (relative to training/hiring further human care staff) seems somewhat speculative (Segel-Brown et al., 2021; Raycraft, 2021). Moreover, the question of access raised in the previous paragraph persists. The likelihood of implementing one robot per resident in a care home (or even issuing one robot per residential home) seems unachievable, given that "making robots a bigger part of such care requires not just [large-scale] technological development" but significant time and energy to provide initial training to staff before being implemented with older adults (Savage, 2022, para. 35; Franke et al., 2021). Governments would face similar challenges to the ones posed in the hypothetical scenario above in determining how to allocate a limited number of available models to an incredibly large number of older adults in need. As expressed throughout, SARs as a category of assistive technology can conceivably be argued as being in its infancy. Consequently, the growing financial and research investments from both government and educational bodies into presenting SARs as a viable option for the very immediate issue of the quality of LTC care appears to be a somewhat straitened approach to finding sustainable solutions.

While the majority of this thesis has considered the ethical ramifications with the protracted use of this technology with a care ethics framework in mind, I also argue that the rapidly growing interest in creating and implementing SARs is indicative of a larger framing issue on the part of aging care stakeholders. I contend that proposing SARs as a solution to addressing the dearth of care resources for older adults is merely a stop-gap solution. When describing the gap in care services for the ever-growing population of older adults, proponents of this technology tend to briefly summarize the issue as ultimately requiring a technological fix because “the supply of health care workers will substantially decrease as they too are aging and a large number of them will retire in the next several years” (Louie, Han, & Nejat, 2013, p. 1). This position treats sophisticated care robots as the best or only avenue to address this lack of care workers required to care for a rapidly aging population. However, this position also fails to examine if there are other reasons contributing to the low number of available LTC staff and the low uptake of new care workers entering the aging care sector.

The quality of the working conditions in the aging care sector is an extremely pertinent aspect in considering the lack of care resources for meeting the needs of the older adult population. As asserted earlier in this thesis, the “conditions of work are the conditions of care” (Armstrong, Armstrong & Choiniere, 2015, p. vii), and research has demonstrated that many LTC institutions mandate that staff must “complete their work within regular hours, and … [do] not pay overtime in order for regular duties to be completed, thus giving workers the choice between ignoring resident needs or putting in unpaid overtime” (Braedley et. al., 2017, p. 98). Similarly research has shown that LTC staff often leave these jobs because of issues with inconsistent weekly hours for insubstantial pay, in addition to psychological burnout stemming from “misunderstandings regarding training requirements, lack of decision-making [opportunities as an employee], miscommunication, and unclear expectations [around daily responsibilities]” (Butler et al., 2010, p. 675). In an article for Hospital News (n.d.), authors Linda Silas, a nurse and President of the Canadian Federation of Nurses Unions, and Pat Armstrong, a distinguished Research Professor Emerita at York University, argue that “any efforts to overhaul long-term care must … include basic standards for care, occupational health and safety, and staffing” (para 5).

Moreover, the lack of consideration for improving the conditions of care for the existing labour force of LTC workers reflects a general devaluing of care work. Care ethics scholar Fiona Robbinson (1999) argues that our approaches to care have shared presumptions about what values ought to be at the forefront of our caring endeavours, which she argues are primarily "autonomy, independence, non-interference/non-intervention, [and] self-determination" (p. 7). Moreover, Robinson (1999) further contends that this "has resulted in the creation of a global 'culture of neglect' through a systematic devaluing of notions of interdependence, relatedness, and positive involvement in the lives of distant others" (p. 7). Consequently, the continued interest and investment into creating ever-more sophisticated assistive technologies for older adults aiming at "decreasing their dependence on other people" (Sharkey & Sharkey, 2012, p. 30) is largely unsurprising.

As stressed throughout, I am not committed to the position that the application of assistive technologies, in particular assistive robots, is a universally inappropriate approach to social issues. Rather, for the particular issue of meeting the care needs of older adults, it is not a solution that prioritizes the values of care that underpin successful and authentic care relations. Furthermore, it is a proposed solution that has many of those who work in the aging care sector upset and confused "that [their] management is buying robots instead of creating new jobs" (Franke et al., 2021, p. 4). As argued in Chapter Three, authentic and comprehensive caring relations involve "doing good, for others *and for oneself*" (Kleinman, 2012, p. 1551). Recall as argued in Chapter One, our recent definitions and cultural understanding of what constitutes healthy and successful aging devalue notions of dependency and inter-relatedness (Holstein et al., 2011). Consequently, definitions of successful and comprehensive aging care often fail to emphasize it as an inherently relational and dependent practice, and having needs is treated as something that denigrates the receiver, while assuming that there is very little benefit the care-giver gains from being in the relationship (Barnes, 2012). Barnes (2012) summarized the following quote capturing discussions between members of the research team in her study on well-being in old age, noting that:

> Management should be looking at this – private homes are about making money, and a culture can develop where staff don't feel valued. The human demands of care work are such that the profile of the work should be given – it should be recognised that the work is really important you are working with people at the end of their lives, it can mean that there are difficulties you can't always resolve things, therefore the staff need to be well supported otherwise you de-humanise you stop seeing residents as people which is the worst thing that can happen, and you can become immune to how dehumanising it is – lack of recognition of personhood and how really bad actions can be normalised and not noticed. Care is not valued in whatever context it's given – the devaluation of care. (p. 132)

These observations on the part of the research team members lend support to overarching concern on the part of care staff that their work, and the meaning they make from it, is at risk with the implementation of this category of assistive technology. While it may be generally held perspective amongst aging care stakeholders that "there is no replacement of human communication" (Franke et al., 2021, p. 10), how that stance is actually promoted and upheld in the policies and practices of caring spaces is a very different matter altogether.

This kind of technological fix for the issue of providing quality aging care appears to be some time away from being a mainstream and prompt solution. I would argue that turning our collective sights towards creating safer working conditions for care workers, implementing policies that address compassion fatigue and burnout in the workplace, and appropriately compensating care laborers so that the field of aging care becomes an attractive field of employment is a more effective use of our scarce resources. If the conditions of care labor no longer result in high-turnover rates amongst staff in LTC facilities, less compassion fatigue and workplace injuries, perhaps opportunities for the socializing SAR developers argue is so essential to the lives of older adults would be made possible with their human caregivers. Moreover, by working to improve existing aging care institutions and programs (and more specifically the caregivers who work within them) we create new opportunities to encourage and nurture what lies at the heart of authentic and comprehensive care relations. Namely, a mutually beneficial exchange of existential knowledge and presence between two human beings.

In sum, I have presented a number of substantial concerns regarding the successful implementation and long-term feasibility of SARs technology. These concerns include trends in the management of LTC facilities, the logistical challenges of implementing SARs technology, financial constraints associated with SARs, and considerations on the devaluing of care work in order to add support to the ethical critique that ultimately such technology would not merely supplement human caregivers, but potentially replace them and ultimately reduce the number of opportunities for older adults to have human-to-human care interactions. In the following section I delineate alternative approaches to aging care that challenge traditional models and present other avenues for research and funding outside of SARs. In doing so, I hope to provide a novel direction for LTC stakeholders to consider and advocate for while making changes to best care practices in LTC facilities, in addition to any other social or private program that involves meeting the care needs of older adults.

4.4.2 Alternatives to Traditional Models of Aging Care

Traditional approaches to aging care create spaces where good care is difficult to achieve. Certainly, SARs are not the only example of interventions for aging supports that do not appropriately consider and address the needs of older persons. As stated earlier in this thesis, care that is provided by a human care-giver doesn't not automatically guarantee the care provided is good, or otherwise meets the needs of the care receiver. In a report on crime and abuse against seniors, Gabor and Kiedrowski (2009) noted that of a surveyed 1600 nurses and nursing assistants, close to two-thirds had witnessed "the rough handling of patients in nursing homes, staff verbally abusing patients by yelling or swearing at them; [and] embarrassing comments being made to patients." (Section 5.3.2, para. 2). Similarly, Cook (2008) asserts that care homes are not naturally spaces where aging persons feel their well-being is being served, as "the routines of care can strip away their personhood… [and aging persons] experience loss of control when they are unable to carry out the decisions that they [used to] make" (p. 270) freely before moving to a residential care space.

Furthermore, the most common care support options for aging persons (e.g., care institutions or home care) are largely inaccessible. Health Quality Ontario (2019) found that in 2019, the median wait time to transition to a care home from the community was 159 days. The median number of days to transition to a care home from a hospital was slightly less, at 90 days, however, seniors waiting to transition from a hospital also end up impacting a hospital's ability to provide services to other patients who require hospital care. The National Institute on Ageing (NIA) (2019) notes that approximately "430,000 adult Canadians were recently estimated to have unmet home care needs" (para. 6) and that "22 percent of older Canadians entering into nursing home environments could be better cared for at home with appropriate home and community supports which are not always available" (para. 7). In short, the available care supports are insufficient to meet the needs of the increasing number of older people in our communities. Furthermore, these existing care resources often fall short of meeting the needs of aging persons, and many care support services and institutions have become sites of neglect and abuse.

Where does this leave us? Certainly, I do not wish to create any impression that I believe there is a one-size-fits all approach that will lead us to comprehensive long term care supports for aging persons. Solutions to the aging care crisis will need to be fluid and creative in order to address how variability in funding, geographic location, culture, and a myriad of other factors will impact what kinds of services can be sustainably implemented in a given community. Importantly, however, we can make observations about the kinds of values that guide our conversations about designing and implementing aging care supports, including assistive technologies. Tronto (1998) wrote that approaches to elder care are interesting in that "the elderly seemed to be 'marked' with an assumption that they need more assistance" (p. 19) and that elderly people are treated as needing "'special' care" (p. 19). I find this position convincing; our socio-cultural distance from notions of vulnerability, disability and dependence has resulted in older adults being posited as a unique population in terms of their care needs. In reality, older adults are not significantly different in having a greater need for health services, transportation, or housing. Held (2006) argues that:

> Every person starts out as a child dependent on those providing us care, and we remain interdependent with others in thoroughly fundamental ways throughout our lives. That we can think and act as if we were independent depends on a

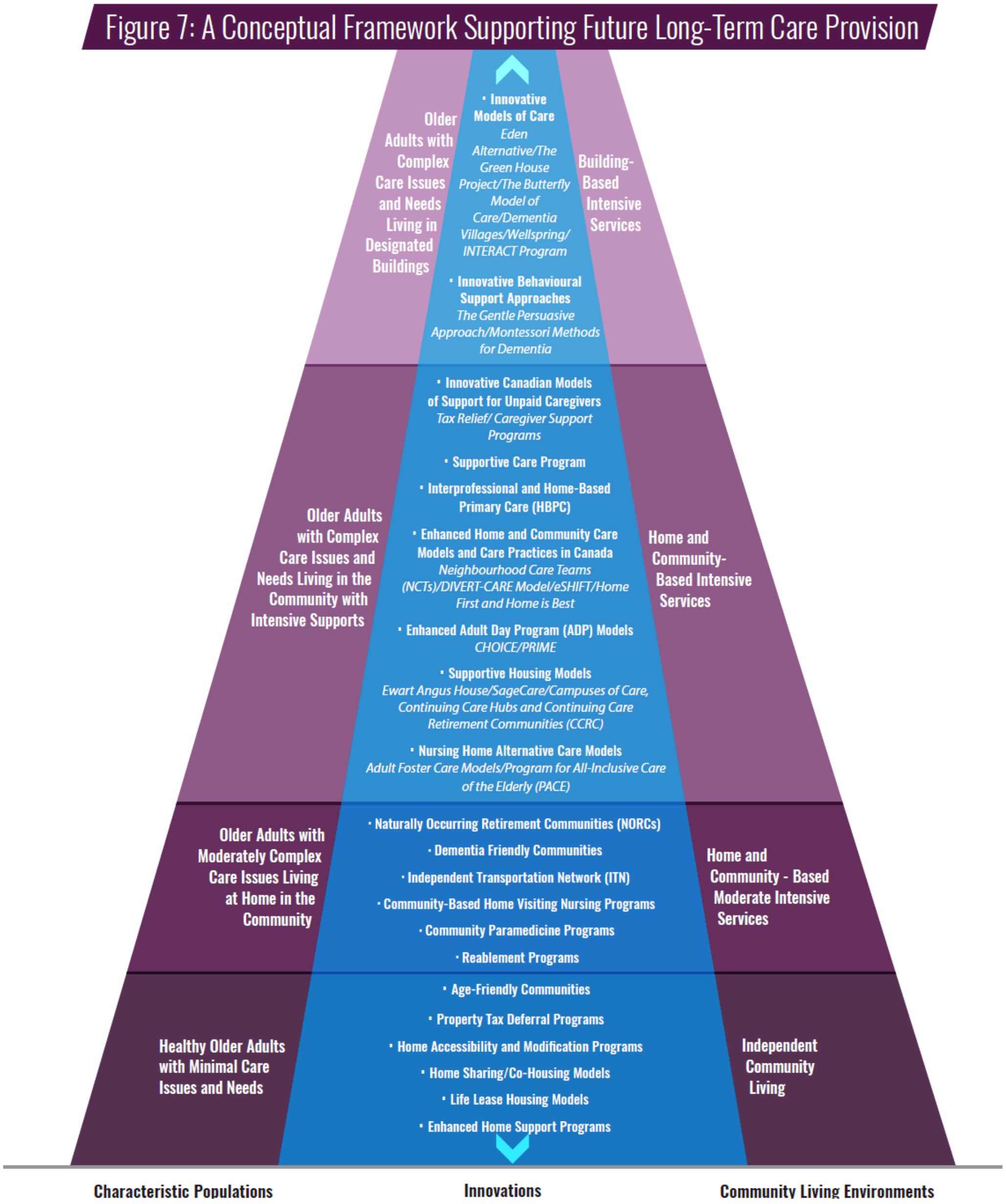
> network of social relations making it possible for us to do so. And our relations are part of what constitutes our identity… This conception fosters the illusion that society is composed of free, equal, and independent individuals who can choose to associate with one another or not. It obscures the very real facts of dependency for everyone when they are young, for most people at various periods in their lives when they are ill or old and infirm, for some who are disabled, and for all those engaged in unpaid ‘‘dependency work.’’ And it obscures the innumerable ways persons and groups are interdependent in the modern world. (p. 15-16)

To treat aging persons as somehow especially dependent distances ourselves from the reality Held articulates above, which is that we all have caring needs. So much of what underpins authentic and useful care is the recognition that we are all vulnerable in a variety of ways. Tronto (1998) writes that part of our unwillingness to recognize and legitimize our own care needs stems from our "inability to comprehend death" (p. 19), that is to hold space for the reality that no matter how well we care, human life ends in death. I believe we think similarly about aging; to distance ourselves from aging persons and failing to listen to them when they try to articulate their needs, is to distance ourselves from our own reality, which is that we all age. If we approached aging care with the knowledge that "the diversity of practices required to care for elderly people's needs is as great as the diversity of caring for people of other ages" (Tronto, 1998, p. 19) then perhaps we would all cope with our innate vulnerabilities better.

There is a growing body of scholarly and community-based work exploring programs and supports that may better address the complex range of needs of aging persons. Recognizing the type and degree of needs of aging persons as highly variable means that our resources may be distributed and utilized more effectively. The NIA (2019) notes that "the long-term care services that are made available lack the level of flexibility and choice needed to meet the diversity of needs of care recipients, care providers, and unpaid caregivers" (para. 14). They propose a framework (see Figure 2) that recognizes that aging persons with more complex care needs require a different approach than those with moderately complex care issues. Here, each of the four levels in the figure correspond to an increasingly smaller and complex characteristic sample of an aging population. Importantly, what this framework proposes are interventions that are heavily community oriented. In the report "Enabling the Future Provision of Long-Term Care in Canada" (National Institute on Ageing, 2019), the authors elaborate on a number of possible options within a staggered approach to diverse aging care needs, including (but not limited to) age-friendly communities, which respect and support the needs of older adults, including those who may need higher support due to dementia, or other degenerative conditions; home accessibility and modification programs; home sharing and co-housing models; enhancing home support programs, so that they can complement existing home support services; community-based home visiting nursing programs; and, community paramedicine programs (e.g. utilizing paramedics as a non-traditional support to address emergent health needs for older adults).

At first glance, perhaps compartmentalizing our approach to aging care seems like a counterintuitive way to address the aging care crisis. However, I am inclined to agree with Kleinman's (2012) perspective that care "needs to be understood as a process that is affected by emotional, political, and economic realities… but that does not mean that the market is more fundamental than caregiving" (p. 1551).

Figure 2



Note: NIA's proposed framework for addressing aging care needs, where older adults are assessed based on degree of care needed. From *Addressing the Long Term Care Needs of Ageing Canadians,* by the National Institute on Ageing, 2019.

The process of changing how we approach and create supports for health aging ought not to be reduced to conversations on “the clarion call of efficiency” (Kleinman, 2012, p. 1551). Certainly, the developers of SARs have rightly recognized that aging persons and their caregivers need novel solutions to help address caregiver burnout as well as social isolation and loneliness, while recognizing the fiscal reality that our care institutions must operate under. However, stakeholders who voice concerns around maintaining these fiscal responsibilities while attempting to find solutions for our healthcare systems often veer into the assumption that ‘something is better than nothing’. In the case of support for a rapidly aging population, that ‘something’ would appear to be the use of SARs. As discussed in section 4.3.2 , a question remains as to why more attention has not been paid to addressing the working conditions of care labourers as part of the solution to a dearth of aging care resources instead. Rather than emphasizing a solution that is far from being a mainstream and easily accessible option, I contend that we ought to begin with examining our health systems for the issues that are leading to these gaps in our care for aging persons in the first place. If SARs are to have an useful and appropriate role in our lives, further attention should be given to developing more robust forms of government legislation concerning privacy and consumer protection, as well as “voluntary ethical code[s] of conduct for robot manufacturers … [and] for ethics committees to develop codes of ethics for use of care robots in healthcare institutions” (Johnston, 2022, p. 14).

With that said, I have argued that much of the interest in the use of SARs reflects how care as a value and practice is not appropriately valued in our current society. SAR developers assert that implementing other kinds of cognitive and social interventions “requires considerable resources and people, and trying to sustain them on a long-term basis can be very complex and time-consuming for healthcare professionals” (Louie, McColl & Nejat, 2014, p. 140). Moreover, SARs are seen as a way to “reduce a person’s dependence on caregivers” (Louie, McColl & Nejat, 2014, p. 140). This perspective is antithetical to the tenets of care ethics which, as I have illustrated throughout this thesis, emphasize approaches to care that argue we are inherently inter-relational, and our caring practices ought to reflect this. Once again, I reiterate that I am not committed to the position that there are no useful applications for assistive robotics. Yet I fear that the proposed application of this technology risks dehumanizing aging persons, reducing their complex inner worlds and very real interpersonal needs to merely another item on a daily checklist.

4.4.3 Concluding Thoughts

I have appealed to the limited nature of existing SAR models to demonstrate that not only do they have restricted practical application in the completion of relevant caring tasks, but more fundamentally, that they will always fall short in caring for human beings simply because they are non-human. We should not mistake simulated facsimiles of conversation, humour and compliments for genuine communication and connection. Socially assistive robotics technology ultimately cannot perceive care in a comprehensive manner, wherein they understand caring actions within the larger context of a care relationship. I have provided strong reasons as to why it is important to treat all caring tasks as possibilities for addressing a person’s deeper existential care needs. If we hold that human beings should be treated as ends in themselves, we ought to be at least somewhat concerned by a technology that may further isolate a demographic already struggling with social connectedness and finding meaning in their lives as they age. I argue that SARs further remove opportunities for older adults to have their care needs vocalized, in addition to being able to rely on their caregiver as a source of moral support and solidarity. It is important to note that this thesis is not committed to any claim that there are no useful applications for robotics technology. However, I argue that robots designed to merely mimic the complex, emotional care relationships between human beings when attempting to assist with day-to-day living are ultimately not enough to meet the needs of aging persons. Certainly, assistance with daily living tasks is a relevant need that has been repeatedly articulated by older adults and their caregivers, however, SARs are just one proposed solution to help address this need. I have referenced other options for aging care that challenge traditional models including the NIA's (2019) conceptual framework, which includes co-living models, programs for utilizing nurses and paramedics to address emergent health needs so older adults may remain living at home longer, as well as promoting the construction of age-friendly communities to nurture a variety of interpersonal relationships for aging persons.

In sum, I believe that caring is fundamentally about "attending, enacting, supporting and collaborating" (Kleinman, 2012, p. 1551) and ought not to be reduced and compartmentalized to individual tasks abstracted from a person's particular lived experiences which can and will affect their care needs. Moreover, these caring needs fluctuate and are transformed everyday within our social structures. I have endeavoured in this project to create an opportunity for reflection on the values we see present in the current approaches to addressing the aging care crisis. To grow old is an inevitable part of life, for those who do not die before reaching that stage in their lives. I believe as our world continues to evolve and change, we must also continue transforming our understanding of how good care can be achieved. Certainly, there is a place for assistive technologies in many domains of our daily lives. However, I have argued that the complex and diverse range of care needs of the population of older adults are unlikely to be met with the use of socially assistive robots.

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