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CO-PRODUCING FRAGILE BODIES AND THEIR TECHNOLOGICAL FIX

Analyzing Two Promotional Videos for Ambient Assisted Living

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I dedicate this thesis
to the unknown
and the future, past and present

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Introduction

ESTABLISH A PROBLEM, SO YOU CAN FIX IT

Here is the good news: We live longer! Yet, wait a minute - Do not celebrate the increasingly longer life we spend on this beautiful planet! Living longer is becoming a problem. A societal challenge, even. Addressed in terms of "aging" or "greying" societies, the apparently ever-growing life expectancy is framed as highly problematic, especially considering the simultaneous decreasing in fertility rates: While we tend to live longer, we are having fewer children – resulting in a growing cohort of people entering their late life – and needing care. What we are facing is a severe demographic change, one that deeply transforms our societies. Growing old, and growing increasingly older, then becomes a problem, and age a category for concern. How can the financial basis of social welfare be maintained? Who is to care for this ever-growing population of elderlies? Can we ensure the quality of care-services? Particularly, as we still do not have answers for how to account for the growing demands of health- and eldercare-services. These structural changes entail challenges for our economies and social welfare states. When we are talking about "aging societies", what we are facing is increasingly also a "care crisis"! So put your bottle of champagne back into the fridge: Yes, we live longer – yet this is not good news after all.

It is this alarmist tune – albeit in varying nuances - that runs through the well-rehearsed story of demographic change we are being told when it comes to introducing Ambient Assisted Living (AAL)[1]. Innovations in eldercare-technologies are framed against the backdrop of this account on social change associated with aging populations. It is a means of creating awareness for a challenge that demands a technological fix.

Yet, if STS has taught us nothing else, it's that knowledge and its material embodiments are deeply embedded in, and entangled with, society. At its time this was a controversial and provocative standpoint, challenging the well-established notion of the natural essence of knowledge and the neutral facticity of artifacts. If we are meant not to take the facticity of knowledge for granted; if we indeed prefer to believe that knowledge is embedded in and reproduces social orders, what does this mean for the alarmist stories about "aging societies" and the "care crisis"? After all, the diagnosis of our societies to be deeply transformed by aging is an integral narrative in framing new technologies for eldercare. It is continuously rehearsed in the context of AAL. Whenever we learn about new breakthroughs in AAL, we encounter stories about aging societies and about how innovation will help to overcome this challenge. So, how can we situate this narrative? How can we understand it in terms of a means for framing AAL as a political tool for situating AAL within the social orders upon which they are based? Or in other

[1] Ambient Assisted Living, in short, are new technologies that are ought to create a supportive technological

words, how can we understand the stories of "aging societies" and the supposed "care crisis" in their political dimensions for establishing Ambient Assisted Living?

This study seeks to shed light on those questions by opening up the black box of the "care-crisis" narrative, building on the case of CAST's corporate videos promoting new technologies for eldercare. CAST ("Center for Aging Services Technologies", a sub-unit of LeadingAge, which is a key actor in the US eldercare sector), published two different videos in 2005 and 2012, titled "Imagine: The Future of Aging" (2005) and "High-Tech Aging" (2012). As I am going to elaborate in this study, CAST clearly deploys these videos as a means to pursue its political aims of establishing and diffusing AAL, and thus offer a rich case for studying the political efforts involved in setting a research agenda for Ambient Assisted Living. These visions are developed through telling the fictional stories of two elderly persons and their families as they encounter challenges when coming into an old age and caring for their relatives. CAST uses its videos for establishing a future-vision of technologically improved eldercare by drawing upon the larger "care-crisis" narrative and translating it to the problematization of late life and aging on the videos' individual cases of their fictional leading characters. The challenges they encounter are embedded in the wider narrative of the "care-crisis" - and are resolved through technological intervention.

As such, the case of LeadingAge CAST's videos offers a unique perspective on how making the future of technologically assisted eldercare can be understood as a political means for establishing a research agenda for AAL and creating the investment of different actors in participating in it: It offers the opportunity to understand how social and knowledge orders are co-produced in making CAST's future-vision and how they feed into the establishment of an research agenda for AAL that situates CAST as a key actor.

Subsequently, in this study I am going to argue that CAST mobilizes a deficit logic of late life that frames aging, in a purely negative way, as a societal challenge, which calls for a (technological) fix. In this thesis I am going to develop this deficit model of late life. My main argument suggests that CAST utilizes this deficit logic and organizes its future around it to establish late life - and aging more generally - in a problematizing and even alarmist tone. Building on this deficit model of late life, CAST positions itself and its promoted technologies as the ultimate solution to this problem. The power of such a deficit-fix-discourse, as I am going to show, rests on "downgrading" elderlies through their problematization and negative representations, rather then merely promising improved and better futures. Simply put, in order to establish its future promise of technologically improved care, CAST first needs to actively frame and construct a problem that demands a fix, of course, CAST is prepared to provide.

Thesis Structure

The first parts of this study are dedicated to discussing and presenting the research design, including the state of the art (**chapter 1**), case description (**chapter 2**), as well as the research question (**chapter 3**), theories and sensitizing concepts (**chapter 4**) and methodological approach (**chapter 5**). The state of the art presents STS takes on the future in general and discusses current research on Ambient Assisted Living within the field and beyond – and will argue for a striking lack of occupation with making the future of AAL, despite the existence of a well-rehearsed imagination of the future of care embedded in its promotion. In the case description I will introduce CAST's corporate videos that serve as the case for this study and present in chapter 4 the questions I am eager to raise in respect to this case. Chapter 6 provides an introduction to video analysis.

My analysis is dedicated to establishing the deficit model of late life and to showing how it used by CAST to frame and promote its technological fix. **Chapter 6** will situate LeadingAge CAST as an "interface organization" within the US eldercare system. In **chapter 7** I discuss CAST's repertoires for representing late life and how it achieves the establishment of aging as a problem influencing a variety of actors (thus constituting the relevance of the problem for them). In **chapter 8** I am going to discuss how this deficit logic of late life allows CAST to establish AAL-technologies as a fix for this problem – and how representations of the technological component of CAST's future-vision build on and rehears the deficit framing of late life. **Chapter 9** will then be dedicated to highlight how CAST seeks to show the transformations and improvement of care through technological innovation, establishing the benefits of its technological fix. Building on these observations, **chapter 10** of this study provides an analysis of how the deficit logic of late life is used to establish a societal challenge, which is resolved in introducing new technological applications – establishing their development and implementation as obligatory passage point. I am going to show how CAST deploys in its videos a powerful discourse of framing aging in a deficit-logic that requires a technological fix.

Instead of showing improvements facilitated by technological innovation, the videos present a "downgrading" of late life – its framing in purely negative ways. In order to promote its fix, CAST establishes a problem. I am going to show how specific interpretations of social orders are offered to facilitate the technological fix. As such, Ambient Assisted Living and understandings and representations of late life as well as of care cannot be separated. The first is not the mere answer of the problematic conditions of the latter. Rather technological and social orders appear to be co-produced: Only against the backdrop of the powerful narrative of social challenges associated with aging do Ambient Assisted Living technologies appear meaningful; establishing the deficit logic of late life then appears as a political means for introducing AAL to research agendas, as I will elaborate in the **conclusions**, where I also am going to reflect on the deficit model of late life and its role in making CAST's future and promoting its technological fix.

Chapter 1: State of the Art

OVERVIEW OF INQUIRIES IN FUTURES AND AMBIENT ASSISTED LIVING

In this section I am going to address the current state of the art of STS-research on Ambient Assisted Living on the one hand, futures and future-making on the other. I am first (chapter 1) going to start-off with a discussion of STS research into "the future".

*In (**1.1**) I offer some attempts for conceptualizing the future and discuss how STS addresses the topic of risks as a meaningful aspect of discussing futures (**1.2**). I then turn to inquiries in predicting the future and how this matters for technology-development (**1.3**). In (**1.4**) I highlight some cultural aspects of "the future" and turn afterwards (**1.5**) to the role of futures in scientific inquiries. Before highlighting key questions for inquiries into the future from an STS perspective in the concluding section **1.7**, I discuss (**1.6**) the means for adjusting futures.*

*In **sub-chapter 2** I provide a discussion on the state of the art on Ambient Assisted Living, where I briefly highlight current concerns in and beyond STS before turning to the striking lack of concern for the establishment of futures of care and aging and how it impacts and shapes the research and development of Ambient Assisted Living.*

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1| Conceptualizing Futures: Tempor(e)alities in STS

> "[…] [W]e find ourselves at a moment in Europe's history when more than ever before our future is imagined as being dependent on and driven by a constant flow of innovations. Careful consideration is necessary about how societal development is understood, what meanings get attached to the very notion of innovation and how we think innovation is best brought about. In playing a key role in making Europe's future, both the 'sciences and engineering' and the 'SSH' [social sciences and humanities, note] will thus be challenged to collectively imagine and realize futures that seem worth attaining to Europe's diverse citizens" (Felt, 2014, 386).

Futures are both, contested and sites of competition: Multiple futures are competing for visibility and credibility, are contested and withdrawn or incorporated and facilitated. The role of social sciences as part of, and in regard to, the European Innovation Union - illustrated in the introductory quote – stands for the newly found importance of "the future" for science and technological innovation. Futures, in Felt's quote, are driven by "a constant flow of innovation", as it is itself a matter of competition over definitions: How do we* want our futures to look like? What could we expect from them? How do we* want to - and how can we* - shape them?

It is in this context that STS has increasingly turned its attention to futures as empirical object. In 2013's Science Policy Briefing on "Science in Society: Caring for our futures in turbulent times", Felt et al. associate this relatively new interest in futures with recent contemporary dynamics, where "we witness a 'colonization of the future'" that "[…] has become visible through massive investments in the development of anticipatory methods such as technology assessment and foresight exercises" (Felt et al., 2013, 16). Following the growing concern with futures – and particularly their anticipation and prediction -, also research in STS increasingly focuses on the futures, asking what they are, how they are made, and by whom: Who is this *we** that cares for and makes "the future"? And what are the (science-)political roles of futures in contemporary societies and particularly in science and in technology development.

1.1| What is it? Empty or open futures

With the rise of modernity, following the industrial revolution, the concern with futures gained a new trajectory. Once perceived as pre-determined and fixed, following a "divine planning", increasingly appeared to be open for human interventions: What once was perceived to be stable and unproblematic, futures became a matter of concern, planning and prediction. Already Luhmann (1976, 131) explained that futures "contain, as a functional equivalent of the end of time, emergent properties and not-yet-realized possibilities. It becomes an open future". This new concern for futures, as they become open to action and intervention, marks an important turning-point occurring in the 17th or 18th century (Ibid., 132): The occupation with futures (that can potentially contain everything and nothing) became more central than the occupation with pasts, as soon as they were emptied from their divine determination. So what is this new conception of futures? For Luhmann, "the future" is first of all an open space with all its potentials and possibilities for action and intervention. A perspective of futures that appears to be open is later the basis for Adams & Groves "colonization" of futures - a key understanding in STS. "Open", here, does not imply "free" from content and influences. In the end, Luhmann identifies the present as the instance for *making* both, futures and pasts:

> "[…] [T]he relevance of time (in fact, I would maintain: relevance as such) depends upon the capacity to mediate relations between past and future in a present. All temporal structures relate to a present" (Ibid., 137).

This points to a deeply constructivist understanding of time, where pasts, presents and futures are products of interpretations and framings: What the future and the present entail, how they are formed and formulized depends on how we* interpret our pasts and futures. This clarifies why futures, despite their *open*ness, are not at all *empty*: They are constructed through interpretations of present and past states and how we look at and problematize the worlds we live in:

> "In contemporary industrialised societies, the future is represented as an empty space into which we move unhindered, its vacancy allowing us the freedom to transform and improve our lives. This understanding of the future is not just a mental image, however. It informs and drives all kinds of social practice, constituting a basic habit of mind through which complex social activities can be coordinated" (Adams & Groves, 2007, 57).

Futures in their modern conception abandon the idea of pre-determination and substitute it with a notion of futures that frames them open to human intervention: Futures are to be shaped and molded with. Adams and Groves argue that the notion of "making the future" is a practice of opening up and closing down; of "colonization". Futures in western modern conceptions (i.e. relieved from the idea of a "divine plan", freed of deterministic pre-definition) are perceived as open spaces that are shaped only by imagination.

Along with this shift towards opened-up futures that are *ought* to be shaped by human intervention and according to human's imaginations, the occupation with how to shape futures and predicting *potential* future outcomes saw its rise in modern societies: Just as futures are more open, they become increasingly uncertain and thus require careful attention and planning. Adams and Groves criticize the "emptying" of futures as *practice* in contemporary industrialized societies. As the future is *made to appear* "emptied of content and extracted from historical context", it "invites imagination and inventive action. […] An empty future is there for the taking, open to commodification, colonization and control, available for exploitation, exploration and elimination, as and when it becomes appropriate from the vantage point of the present" (Ibid., 13). The occupation with the future and its new relevance are bound to a modern, industrial-capitalist conception of the future that follows a logic of exploitation: Futures are spaces for optimization, they are "there for the taking", and predictions have the role of identifying potentials and obstacles for improvement. But "the future" (or, rather, the multiplicity of potential futures) is not as empty as it is framed and performed: Rather, for Adams and Groves, it is rooted in the interpretation of presents and pasts and what becomes associated as problems and challenges that are to be resolved through future-oriented action. This puts forward a conception of open futures that, then, does not imply their emptiness, but their framing as such. Brown et al, in the first chapter of their collection "contested future", stress the importance of such a constructivist view on futures, when explaining that they don't:

> "[…] postulate on the probability of one future against another nor generate normative prescriptions about particular futures. Instead, the intention here is to turn the analytical gaze towards the phenomenon of future orientation itself. The purpose of this analysis is not the future *per se*, but the 'real-time' activities of actors utilising a range of differing resources with which to create 'direction' or convince others of 'what the future will bring'. As such, our purpose is to shift the discussion from *looking into* the future to *looking at* how futures as temporal abstraction is constructed and managed, by whom and under what conditions" (Brown et al., 2000, 4).

For Brown et al, producing and facilitating future-visions is always tied to the competition with others and their version of "the future". Futures are not given, they do not pre-exist themselves, but they are made in specific social settings. Accordingly they do not emerge out of the blue. Just as they are rooted in the presents and pasts and their interpretations, future-making is a deeply social process: Cultural norms, knowledge orders, and so on, are a key-source and strongly influence the shaping of futures.

The "openness" of futures then must be understood as a call for planning and for prospecting interventions. Associated with this call for prospecting action is the perception of futures as being

risky: Just as much as we can shape the future, in this logic, shaping the future entails altering the present. The more open (to intervention) the future becomes, the more important get predictions for outcomes of these interventions. This association of opened-up futures, future-oriented interventions (actions that aim at altering the course of developments – (usually) aiming at improvement, prospected into the future) and predictions is what makes Adams and Groves calling for analysing futures in terms of colonization: predictions are contextualized and politically organized in in order to facilitate action ("pollution" and "exploitation"). A key role is assigned to science (as means for predicting the future) and to technology (as means to providing potential solutions): In making these (scientific) predictions and providing (technological) solutions, the occupation with the future is heavily concerned with finding and providing the means for managing risks and controlling social dynamics. As Felt et al (2013) explain, Adams and Groves (amongst others) "have indicated the increasing attention given to anticipating, transforming and/or controlling societal futures through science and technology".

1.2| Risky endeavors into the future

Risk is a key notion for contextualizing the modern framing of futures, closely tied to this need for prediction and foresight. The notion of increasingly uncertain futures is marked by the substitution of "danger" with "risk" that comes along with the emptying of futures from the perception of a divine plan, as also Brown et al point out:

> "Beck, for instance, notes the almost crippling degree to which technoscience is widely seen to be both the source of terrible risks and yet the only plausible solution to determining impact and the deployment of ameliorative measures [...]. Such strains are invariably refracted through a heightened public and political reflexivity [...]. This relatively new arrival to what we might call 'future governance' betrays an understanding that sources of hazard require caution even when clear causal connections between today's actions and tomorrow's threats are vague or even improbable" (Brown et al, 2000, 6).

Beck argues for the growing awareness of risks in regard to technological and scientific advances – that is again perceived as only to be countered with technological solutions. These technological risks and their – technological – solution result in a need for governing the future, where science's methods for prediction and forecast are the only plausible tools for managing risks and uncertainties. Baumann, building on Beck, related this new importance of governing the future to the ordering of social worlds. He argues for predictions making risks appear manageable. Allocating agency over the future (cp. also Brown et al.) is necessary to provide the capacity to cope with the loss of order that comes with opened-up futures: "Someone somewhere [...] must interfere with the probabilities, manipulate them and load the dice, seeing to it that events do not occur at random" (Baumann 2000, 55). As the divine planning gets neglected, the order of the world decreases – and is delegated to humans: "In our modern times, with God on a protracted leave of absence, the task of designing and servicing order has fallen upon human beings" (Ibid.): Making the world appear riskier is tied to eliciting the concern with futures and demands a mean for managing and coping with them. The notion of risk becomes associated with these open-futures. Risk is strongly died to the crucial change in what the future is understood as:

> "The contemporary idea of transforming the future carries within it a much stronger element of human influence as well as an underlying assumption that the future can be shaped according to human will. At the same time, it retains the notion that there exists something which is to be transformed [...]. Where the emphasis is placed along the continuum from intervention to transformation and creation depends on whether or not the future is embodied and embedded in processes and events or decontextualized and emptied of content. A commodified future [...] is neither tied to destiny nor conceived as pre-existing. Rather, it is an open future, a realm of potentiality to be formed rather than transformed to human will" (Adams and Groves, 2007, 12).

Futures appear to be inflicted with the past and present, building upon interpretations of current states and associated challenges and projected potential solutions – solutions that call for action to realize them - in the backdrop of risky states that need to be governed. "Making the future" shows to be deeply political (e.g. already at the point of defining risky elements of pasts, presents and futures) and futures are polluted with prospecting actions rooted in the past, realized in the present and directed into a more or less close present-future (In the terms of Adams & Groves: "transforming", "commodified"). It is this very notion of prospecting and retrospecting actions that are tied to time-spaces and, for Adamas and Groves, are strongly related to resulting uncertainties:

> „Most importantly, the enhanced space-time freedom affords us the luxury to change our minds. We can take alternative routes, not follow rules, break with tradition and not do what is expected of us. The very freedom that marks us as humans, therefore, is also inescapably tied to the increased uncertainty and indeterminacy that accompany human action. The associated need to bound and delimit what is potentially boundless and limitless deepens the cultural taming of futures" (Ibid., 44).

And they conclude: "Since the web of socially networked processes of actions and reactions that ensue can be neither known nor controlled, there is a need for cultural responses of a social, political, institutional and legal kind" (Ibid.) – Adams and Groves then describe predictions of the future as "cultural responses" and thus as one crucial aspect of "the future" in its contemporary meaning. These predictions of multiple potential futures then become evidently tied to notions of risks and uncertainties, as they both, construct them and provide solutions – in contrast to the notion of danger, as also Beck (see above) explained. The future gets associated with risk, in a (at least) two-fold manner: The risks of not to do anything (against e.g. current states that are interpret and framed as un-bearable, unjust, dangerous, etc.) and the risk of doing something (wrongly): shaping the future, but failing at improving it (and making it even worse, potentially; cp. Adams & Groves, 53ff). In both instances, anyhow, these risky new futures are first of all associated with human agency: someone can and indeed has to do something against what may be framed as risks, as futures need to be governed. Contesting future-visions are, in this respect, a contest for gaining authority, ensuring legitimacy and assigning agency. This modern conception of futures then entails first of all human agency. In this context then, making and anticipating futures entails primarily the definition and identification, management and control, and reduction or increase of risks.

1.3| Scientific predictions, technological solutions

It is this increased need for governing uncertain futures that constitutes the central position of scientific methods for foresight-exercises and predicting in contemporary societies. The cold and objective methods of scientific inquiries into the future are hoped to provide adequate and reliable measures to ensure coping with what has become uncertain. Simultaneously, science is ought to provide solutions for the risks it identifies. Solutions that are mainly ought to be provided through new technological innovations (cf. eg. Brown, 2000). This tendency of associating futures with risks and providing technological solutions can be nicely illustrated by the myriad of literature on emerging technologies, their opportunities and risks, where technologies not only provide the means of overcoming and managing risks, but simultaneously get themselves associated with bearing (potentially un-foreseen) risks. As also Brown et al point out, the management of risks is a particularly central topic in making (techno-)futures where the appearance of science's methods for predicting and forecasting as "cold" and "objective" constitutes its legitimacy and authority to speak on behalf of "the future". We find accounts on these questions e.g. in (amongst many others) Felt, 2013, who describes the association of "free", "risks" and national identities; and more explicitly on the matter of risks and futures: Diprose et al, 2008.

Here, one crucial question concerns the legitimacy and agency of making futures: Who has the agency and the power to speak on behalf of whose futures? One conclusion is that risk plays a major role in establishing this legitimacy, when Brown et al. (2000) argue that "these considerations have forced on us an entirely new conceptual means of engaging with the future" (Ibid., 7). Facing the complexities of physic's laws, market dynamics or politics, science became the primary means for planning future-actions and managing risks and uncertainties. The ultimate expression of this development may be found in the term "futuring" (cf. Wagner 2004). Michael puts it in a nutshell:

> "To some extent, this dynamic between future colonisation and a growing awareness of future risk, accounts for the demise of the quantitative predictive instruments of the 1970s and 1980s. Without uniformly replacing such techniques, policy has come to rely on more qualitative and collective accounts of the future derived from scenarios, delphi exercises and foresight, though still within a normatively predictive or extrapolative paradigm. STS on the other hand, recognising the capacity of such instruments to shape science and innovation policy, has begun to develop an analytical vocabulary for understanding these complex interactions between tools of prediction, discourses of the future and the shaping of the present" (Michael, 2003, 5).

When asking for who is making the future it is key to understand how the legitimacy to speak on behalf of certain groups and especially in regard to risks and potential solutions is secured. Where potentially everyone has the right to talk about the future, it is a crucial question to ask for who is able to speak on behalf of the future while being acknowledged to have the authority to do so. Science is shown to play a significant role here and Adams and Groves describe the shift from religion, oracles and other "traditional" institutions telling the future, as a matter of discerning a divine planning, to that of science forecasting and predicting it, using scientific methods. And

indeed, Brown et al. identify futures in contemporary societies being mainly technological ones "[…] not least because the experience and projections of late-modern society are […] increasingly framed by techno-scientific language. Typically, our visions of the future are dominated by new technologies" (Brown et al., 2000, 4).

The legitimacy of making futures (that matter; i.e. in the sense that they are acknowledged as legitimate forecasts, as "sound science") derives today from the scientific method, as e.g. Brown et al argue. Brown and Michael (2003), but also Geels & Smit (2000), point to the problem of making future-promises and not fulfilling them and Brown (2004, 12) stresses that the scientific method seems particularly capable of distancing oneself from present arrangements, providing the authority of "objective" knowledge claims. And indeed, Brown et al.'s collection pinpoints to a number of instances and aspects that are crucial for understanding who gains under what conditions the legitimacy of making futures[2]. Michael points to key parameters for the construction of futures: temporal distance, the conception of experience and representations of time and varied functionalities of futures[3]. Science, with its methods of forecasting and predicting, may has a particular powerful position in making futures, but it is not operating in a concealed space[4]. Deuten and Rip make this case on the example of biotechnologies, when they explain:

> "In biotechnology, the arena of contestation has been expanded to include critical professionals, consumer and environmental groups, which are concerned about the possible impacts of environmental and evolution, and about the risks of genetic modification to produce 'Frankenstein' foods. These are all public or semi-public arenas arenas" (Deuten & Rip, 2000, 65).

When one then asks for who is making the future, it is a question of authority and legitimacy, and in this context also of competing voices: Who is included and excluded in contesting and negotiating future-visions on what terms[5]:

> "The notion of 'contested' futures then shifts from a battle of interests with the scenarios, promises and risks as weapons in the struggle, to a recognition of narrative and narrative infrastructure as the environment […] through which actors define their preferred actions and in which they position themselves and others. If this is the basic pattern […] all [actors] collude in creating a multi-actor – and multi-authored – story" (Ibid., 84).

Rappert, additionally, draws attention to the dynamics of the Foresight-initiatives and how the can be understood as means for governing (through) futures (1999), where he argues for foresight

[2] And to whom agency over future is assigned to, as Brown et al explain: Assigning agency e.g. rhetorically, can have for exmaple the function of hiding away other actors involved in actually making it (as indicated in notions of „what the future may bring" as an instance for assigning agency to the future itself).

[3] We then can observe a number of instances and examples, where science gains predicting force, constituting futures, and it's framed-as-objective-methods guide prospecting actions. Manifold examples on risk, and risk-perception-studies in particular, elicit the dynamics of making futures through scientific methods. Classic works in this area include e.g. Auyero & Swistund, 2008; Szerszynski, 1999; and for a broader outline on the conceptualization of risks, its production and STS's take on risks: Lupton, 1999.

[4] This relates to the critique on the vision of science's ivory-tower and linear models of technological innovation.

[5] In this respect one could also raises the question on where futures are made and who has access to these spaces. This goes beyond the scope of this work. Contributions on the public perception of science, especially in regard to public participation exercises can provide some important inspiration on how to address this question. One potential argument could be that of justification and legitimization of scientific accounts in organizing citizen-conferences and other public-engagement-exercises – which relates to a more general criticism on public engagement exercises coming from STS.

being "part of the ever-present need to establish a 'social contract' between researchers, government, and the public" (Ibid., 544). This question of who participates (not) in making futures is also raised by the sociology of expectations, retracing more fine-grained interrelations between actors. Here, ANT is the chosen analytical (or, if one prefers: methodological) perspective. This makes sense, especially when seeking to get a glimpse into the "laboratory" of the future. The theme of contested future remains though, and again power plays are in the primary focus of such analysis. Watts explains this focus as the following:

> "The future is not out there, as though disconnected from past or present. […] [I]t is made in on-going, everyday practices and places […]. The future is always situated, particular to the places where it is made" (Watts, 2008, 187).

Accordingly, the sociology of expectations puts a strong focus on these everyday practices and places Watts mentions, as well as the resources that are drawn upon in constituting agency.

1.4| How culture matters for making the future

When it comes to making futures, one key understanding seems crucial: Culture matters! Jasanoff (forthcoming) articulates this particularly impressively in her *sociotechnical imaginaries*. She argues that the making of futures is rooted in a dynamic process where social and knowledge orders get coproduced. Doing so, she points to the close relationship between those making the future and the context they are being made. Felt (2013) turns this question around, when she argues for the role of national identities in building e.g. a "gene-free" and "nano-free" self-identity of Austria – and a more broader vision of what Austria's future could or should be:

> "[…] [T]his imaginary […] was the outcome of a gradual, long-term, bottom-up formation process, always in need of rehearsal and stabilization work. These experiences worked as filters through which new elements were sieved, as lenses through which new sociotechnical developments were refracted. Keeping these specific technologies out created the imagination of a well-delimited Austria, in its sociotechnical practices different from 'the others.' Thus, a national technopolitical identity had been created, a new self-understanding of Austria as a small nation which can manage to choose a different sociotechnical trajectory than its more powerful neighbors" (Felt, 2013, 16).

Felt points to the crucial role of pasts and associated (in this case: national) identities. Making futures means drawing on (historically grown) social contexts: Mobilizing norms and values and drawing on shared believe-systems. Jasanoff ultimately brings this down to her formula of the sociotechnical imaginary, with which also Felt works:

> "[…] collectively held, institutionally stabilized, and publicly performed vision[s] of desirable futures, animated by shared understandings of forms of social life and social order attainable through and supportive of, advances in science and technology" (Jasanoff, forthcoming, 6).

This notion of socio-technical imaginaries presents a global take on future-making and provides the macro-level-analysis. The idiom of co-production has a crucial role here. It is argued for a strong entanglement of futures and social context, specifically in how narratives of "the future" are used to create visions that are perceived as wishful. Future-making is understood as acts of co-production of social and knowledge orders. This embarks that – particularly deriving from

Felt's observations – using a narrative repertoire that draws on moral values and relates to identities (such as of nationality) supports the establishment of a future-vision to be accepted as valid (i.e. the establishment of a sociotechnical imaginary). Works drawing on Jasanoff's concept of sociotechnical imaginaries (c.p. Jasanoff, forthcoming b) heavily follow the question on how sociotechnical imaginaries are achieved, established, facilitated and diffused, pointing to the crucial role of social orders, moral norms and shared belief-systems.

Futures appear in this perspective as spaces colonized with "scientific and technological visions" that "enter into the assemblages of materiality, meaning and morality that constitute robust forms of social life" (Ibid.). Futures constitute collaborations directed towards realizing them – efforts that are perceived to play particularly crucial roles in the establishment and development of innovation technologies. By explaining this, Jasanoff's socio-technical imaginaries aim at carving out how contingent coordinated science- and technology-politics can be realized on an institutional (and originally: nation-state-)level. Although she puts a stronger focus on how futures inform and constitute collaborative action (a point I get to in a minute), she also pin-points towards the collaborative efforts in making the future, something that is explicated even more so in the analysis by Felt, where different actors participate in making nano-futures, drawing on national-identities that emerged over time and were exercised, tested and modified on other instances, such as bio-technologies and thus being "ready for use". But besides acknowledging the crucial role of science in making futures, particularly the concept of sociotechnical imaginaries points to a wider dynamic, where science and technology seem not only to have a particularly constitutive part in making futures, but also are deeply inflicted and affected by what is accounted for being a potential future.

1.5| Living and working with "the future"

A key aspect of the notion of socio-technical imaginaries embraces the role of shared belief-systems that constitute coordinated actions. When Jasanoff argues that sociotechnical imaginaries are

> "[…] collectively held, institutionally stabilized, and publicly performed vision[s] of desirable futures, animated by shared understandings of forms of social life and social order attainable through and supportive of, advances in science and technology" (Jasanoff, forthcoming, 6),

This points towards the constitutional power of future-visions that become incorporated in practices of knowledge production and technology development. In this, it becomes clear that science is not only capable of formulating future-visions, but it is itself deeply structured and guided by them.

Accordingly, crucial works in STS focus on explaining how science is structured by future-visions. Some outstanding examples are, besides the already mentioned contribution by Felt, e.g. Jasanoff & Kim, 2009; Van Lente & Rip, 1998; Brown, 2003 & 2006. A key assumption is that particularly technological innovation is largely problem-oriented: Depending on what gets problematized as

challenge, issue or problem, different technological solutions will emerge. Understanding futures involves understanding the past and present, particularly in the domains of technology development and science: Futures e.g. play a significant role in framing and shaping innovation technologies: Borup et al (2006) develop the notion of colonizing the future in terms of facilitating actions in the present. They argue that:

> "[n]ovel technologies and fundamental changes in scientific principle do not substantively pre-exist themselves, except and only in terms of the imaginings, expectations and visions that have shaped their potential. As such, future-oriented abstractions are among the most important objects of enquiry for scholars and analysts of innovation. Such expectations can be seen to be fundamentally 'generative', they guide activities, provide structure and legitimation, attract interest and foster investment. They give definition to roles, clarify duties, offer some shared shape of what to expect and how to prepare for opportunities and risks" (Ibid., 285).

Here, futures are a matter of (science- and technology-)policies: In terms of politics of promises and expectations, futures are intertwined with presents and pasts in a two-fold manner: By the often unintended consequences of actions and the interactions of anticipations of futures that shape present actions. And, by projecting challenges, hopes, uncertainties, and wishes into the future, based on interpretations and perceptions of presents: With Luhmann (1976, 131), time is understood "as the interpretation of reality with regard to the difference between past and future". And, as quoted above, Watts (2008, 187) argues: "The future is not out there, as though disconnected from past or present. […] [I]t is made in on-going, everyday practices and places […]. The future is always situated, particular to the places where it is made"[6]. Secondly, the future is intertwined with presents and pasts, as it is directed towards them. Borup et al point towards this, as just quoted: "[…] they guide activities, provide structure and legitimation, attract interest and foster investment" (2006, 285).

Building on Borup et al.'s sociology of expectations, Konrad points out that "shared expectations play a central role in creating the necessary momentum for innovation processes and in the coordination of heterogeneous actors" (Konrad 2006, 430). In this perspective, the making of futures and its analysis in terms of promises and expectations points towards a two-fold political dimension: The allocation of resources and the creation of actor's investment by framing futures in wishful manners – and usually in the backdrop of risks and challenges to be overcome. As Konrad explains:

> "Expectation dynamics have a decisive impact on the pace and direction of innovation processes. They motivate heterogeneous actors […] to engage in promising innovation fields. Thereby expectations serve as coordination devices […]. Expectations […] serve to create the protected spaces necessary for experimentation and learning in the context of precompetitive technologies. Furthermore, expectations contribute to the shaping of technologies, particularly in form of application scenarios or expectations referring to technological components. More generally, expectations channel efforts into certain directions and contribute to the mergence and stabilisation of socio-technical structures" (Ibid., 429f).

Understanding the staging of technology and knowledge as deliberate acts of shaping futures is then crucial: Futures here become colonized spaces that attempt to bring meaning to innovation technologies, facilitate "reason" for developing them (creating investment), and thus constitute

[6] By explaining so, Watts makes explicit the ontological difference between futures, pasts and presents.

their necessity, mostly in the backdrop of risks that are to be managed. Futures are not neutral, objectified predictions, but encompass a "politics of things": arranging actors, human and non-human, in specific ways that are ought to show the future as demanding actions for new innovations. In this, the future is a highly political act of arranging and shifting, establishing its realization as necessity. Brown & Michael (2003) argue for this understanding of futures as deliberate and deeply political acts of arranging and aligning. They stress that "whilst representations of the future have a far-reaching effect on the shaping of technology and knowledge, they must be analytically distinguished form actual events or effects themselves" (Ibid., 7). In this perspective "the future" reaches an almost intrinsically political status, as moral values and norms are mobilized and actors get aligned and situated in regard to futures. Expectations and promises, here, are framing and ordering devices, functioning to secure resources and actors' investment:

> "Of particular importance in all these studies are the explicit or implicit actor roles embedded in expectations. Ideal expectations of future users and their attributes are literally and materially scripted into technologies and socio-technical systems, though these will inevitably be reinterpreted and even subverted in usage" (Borup et al, 2006, 288).

For the sociology of expectation, futures are performative and constitutive in this sense (cp. Burp et al, 2006, 292f; on visual representations Lösch 2006). It also entails that futures strongly structure the development of new technologies, as they frame knowledge orders and facilitate and guide action: This then does not mean that futures are a mere rhetoric tool for justifying and securing recourses, but that future-visions get also incorporated in the (self-)definition of researchers and technology developers and their work. In this sense, futures get incorporated as valid orientation-marks that guide researching activities themselves.

Jasanoff makes a similar argument for her sociotechnical imaginaries in regard to futures' incorporation in belief systems. Here, the future-vision grounded in social orders is strongly constitutive for what becomes possible in terms of technological innovation. This is particularly important, as it shows that future-promises cannot come out of the blue, but must be grounded in the social realms they address. Again, Felt's argument illuminates this connection, as she describes on the example of nuclear energy, biotechnologies and nanotechnologies what is possible (and what is not) to be articulated in terms of future-promises. What technologies become possible and impossible to be implemented in an "Austrian" context is strongly influenced by the imaginaries at work. In Jasanoff's account, the mobilization of moral norms and values serve to establish a system of shared believes, constructed via imaginaries of "the future", and achieving grounds for coordinated and contingent action through their institutionalization. She translates the notion of co-production to the analysis of futures, raising the question of how social and knowledge orders get co-produced in making "the future". A good example for this can be found in Jasanoff's analysis of the production of imaginaries for climate change, where different framings of nature, its boundaries and the problems and problematizations also frame the identities of those incorporating the given imaginaries (cp. Jasanoff 2010, 241f).

1.6| Expected futures: disappointment, investment and entanglements

In this context of science making futures and being simultaneously shaped and structured by them, Jasanoff's notion of co-production (Jasanoff, 2004, 2f) is useful to conceptualize the politics behind making futures: It can serve as bringing together both aspects of futures in regard to science and technology conceptually. Accepting the constitutive power of futures for processes of knowledge production in its fine-grained dynamic (particularly elaborated in the sociology of expectations) just as for science-policies on a larger level (prominently displayed in the works of Jasanoff et al), also the making of futures gains a highly political dimension.

In this respect, future-making can potentially also be understood as accounts for creating investment in research and the realization of new technologies: By constructing future-risks and challenges, making futures can be referred to acts of creating expectations through suggesting solutions for these constructed risks & challenges. The sociology of expectations provides insightful takes on that matter. Borup et al explain the relationship between the creation of expectations and commitment to realizing and advancing technological innovation:

> "[…] [F]uture-oriented abstractions are among the most important objects of enquiry for scholars and analysts of innovation. Such expectations can be seen to be fundamentally 'generative', they guide activities, provide structure and legitimation, attract interest and foster investment. They give definition to roles, clarify duties, offer some shared shape of what to expect and how to prepare for opportunities and risks. Visions drive technical and scientific activity, warranting the production of measurements, calculations, material tests, pilot projects and models. As such, very little in innovation can work in isolation from a highly dynamic and variegated body of future-oriented understandings about the future" (Borup et al., 2006, 285f).

Brown and Michael point towards the strong considerations involved in constructing expectations and promises, where they also account for a historic perspective on disappointment in the failed fulfillment of promises and expectations. They raise the question of what it takes for future-representations to materialize in concrete technological applications – and how future making accounts for changing expectations and "real-world"-developments. They suggest that retrospecting prospects and prospecting retrospects (how the future differs from past-futures in contrast to acts of re-deploying past-futures in the making of new ones) situate actors in their positioning towards pasts and futures (cp. Brown & Michaels, 2003).

Berkhout develops on Brown & Michaels explorations key functionalities of future-visions in the organization of institutional (knowledge-)regimes and how they provide the means for defining common identities of actors living in such regimes. He argues (Berkhout, 2006, 305f) that such visions function as:

- Mapping "possibility spaces"
- Heuristic devices that provide problem-defining frames
- Providing stable frames for target-setting and for monitoring progress
- Metaphors for building actor-networks
- Narratives for bringing together and focusing resources

In this, visions must be seen as part of social processes, not pre-existing them. Rather, such visions (and associated expectations) should be seen as generating coherence by emerging from innovations of systems: They provide the means for co-operation and ensuring the persistence of actor-networks:

> "We want to make two tentative suggestions about normative influences on visions in processes of system innovation. The first is that in the process of being communicated, codified and shared, visions seek in some sense to create a normative space in which they can exist. We have argued that visions are typically moralised—effort is exerted by advocates to attach visions to widely shared values, or contrasted with undesired outcomes. This is necessary because novelty can only seem plausible if it has a chance of being widely accepted as good. [...]" (Berkhout, 2006, 309).

Harro Van Lente particularly convincingly explores this relative power of futures: He describes three key constitutive moments of future-visions for technological development, as he explains:

> "Technological futures are forceful. Once defined as a promise, action is required. This force can be understood as an outcome of language strategies and social arrangements, which, in their tum, are affected by long term historical changes" (Van Lente, 2000, 59).

In his contribution, Van Lente describes futures in terms of ideographs of progress, where developments are legitimized and mobilized through their framing in terms of progress. Further, the notion of progress justifies the labor-divide between what he calls "technologists" and the rest of society (which he coins the "the mandate to technologists"). In doing so, he draws attention to the importance of future-narratives that draw on urgency and progress (i.e. improving current conditions, often in the backdrop of risks and challenges) for constituting action. This is an argument that Kirby (2009) develops further in his diegetic prototypes. He there introduces videos as an important space for making and shaping techno-futures. He addresses the role of depictions of yet-to-be realized technologies in his work on what he calls 'diegetic prototypes' in science fiction movies. In this perspective, videos are intended to depict technological futures to create investment in their actual realization. These diegetic prototypes provide the means for doing so before the production of material prototypes:

> "The presentation of science within the cinematic framework can convince audiences of the validity of ideas and create public excitement about nascent technologies. Fiction's lack of constraints and film-makers' creative assistance provides an open, 'free' space to put forward speculative conceptualizations; it also embeds these speculations within a narrative that treats these ideas as already actualized within a social context. The key to cinematic diegetic prototypes is that they allow scientists and filmmakers to visualize specific methods and technologies within the social realm of the fictional world. Film-makers and/or scientists can use the narrative and visual frame- work of cinema to contextualize and model potential futures for their particular technology whether it be medical, computer or space-based. Cinema provided an ideal vehicle for establishing a technology's necessity, its viability and its benevolence within society" (Ibid., 66).

Depictions of futures are perceived as one important site (amongst many others) for establishing a narrative of "the future" in terms of the sociology of expectations. They also facilitate the associated imaginary for creating investment. In Kirby's conception, again, the aspect of creating investment is thereby an important aspect in future-making.

The importance of the future for and in science and technology-development is manifold: Not only are futures, their predictions and their associations of risks strongly tied to scientific

methods of forecasting, but the futures themselves are a powerful tool for enlisting members and ensuring resources for advancing technological progress. In this, making the future is always an endeavor of contest and competition, and full of shaping and framing science-policies. The importance of dealing with futures becomes strikingly obvious in this respect and accordingly the occupation with the role of futures and their making within science and technology studies gained a new importance in recent years. Yet, understanding the dynamics of the politics of making futures, especially in regard to science and technology, remains opaque, although scholars such as Jasanoff or the sociologists of expectations offer potentially powerful tools for analyzing them.

1.7| STS & "the future": key questions

The concern for futures stretches over a wide range of domains - not only, but particularly also in science and in technology development. Research on futures and how they matter in these contexts involve – as but some key examples - science politics, the entanglements of science, technology and society, the work practices within science and technology development, the allocation of resources and the investment of actors in certain domains and research-areas. The relevance for STS to occupy itself with futures has been increasingly acknowledged in the last decade or so, particularly with the rise of foresight-initiatives, Delphi-exercises, and so on. STS has put a strong notion on carving out how futures matter (and are made to matter) in the context of knowledge- and technology-production. Just two prominent examples can illustrate the different angles futures are addressed form: Sheila Jasanoff and others aim at understanding how coordinated action – especially on the level of science policies – is secured and facilitated, proposing *sociotechnical imaginaries* as one way to look at futures within the entangled worlds of science, technology and society. The sociology of expectations focused on the relations between actors, the constitution of power-dynamics and the role of futures in informing these relational ties. Here a more fine-grained look is put forward, with a strong interest in how single actors (individuals but also groups and institutions) interact on the basis and in the making of futures. Here also the look into the laboratory plays an important role for carving out how future-visions, expectations and promises inform the production of knowledge and the development and up-take of technologies.

Common notions in addressing question in regard to futures and future-making are those of risks, challenges, goals and ways to achieve them when speaking about futures: There is not the "one" given future, but different futures are actively made and constantly contested, withdrawn or incorporated. In this sense, three over-arching questions capture the interest in futures, coming from STS:

- **Who is making (scientific-/techno-) futures?**

  This embarks the role of scientists in producing forecasts, predictions and scenarios and focuses on questions such as: How is the future made and by whom, using which methods, in which (science-)cultural contexts and based on which bodies of

knowledge? Additionally, power-relations are addressed here, primarily asking about who is able to contribute to the making of futures (and who isn't); and which futures achieve – how - to become dominating.

- **How do interpretations of „the future „inform the production of knowledge and technology?**

  In turn, futures are not only perceived to be made (amongst elsewhere) by science: They also influence and affect processes of technological innovation and knowledge-production. A key assumption is that particularly technological innovation is problem-oriented: Depending on what gets problematized as challenge, issue or problem, different technological solutions will emerge. Questions in regard to this concern such of influences: How do future-visions and expectations, as well as the framing of risks and challenges, inform the allocation of resources? How does "the future" influence research policies and strategic decisions in what research to foster? How does it inform work practices within science and research? Which futures are incorporated, while others are withdrawn? In what and how is the influence of future-visions constituted and who profits (not) from their incorporation in practices?

- **How are futures diffused, re-interpret and transformed to/in/by publics?**

  This particularly embarks concerns and questions revolving around participation in making the future, uptake of futures in wider publics, and influence of publics' perceptions of risks and challenges that (e.g. techno-)futures bear in the production of knowledge? These questions are discussed in a variety of research-areas in STS and mostly not only focused on futures, although futures and future-making often plays an important role. Rather we find important insights in debates on risks and risk-perceptions and the debates revolving around public uptake of science, public participation of science and public engagement in science. For a more general introduction to risks, refer to Lupton 1999. For an overview on science, technology and publics see e.g. Shapin (1990), Durant, Evans and Thomas (1989) and Wynne (1992).

2| Uncharted territories: STS' inquiries into AAL

> "[…] the intention here is to turn the analytical gaze towards the phenomenon of future orientation itself. The purpose of this analysis is not the future *per se*, but the 'real-time' activities of actors utilising a range of differing resources with which to create 'direction' or convince others of 'what the future will bring'. As such, our purpose is to shift the discussion from *looking into* the future to *looking at* how futures as temporal abstraction is constructed and managed, by whom and under what conditions" (Brown et al., 2000, 4).

When I ask friends and colleagues, working in the field, to explain to me the term "Ambient Assisted Living" and what it's all about, or when I read abstracts and introductions to publications on the same topic, I usually get the same, well-rehearsed story: One about a growing population of elderly; One the growing concern for how to finance public health care and its quality; And a story that talks a lot about autonomy and living at the place-of-choice when coming in an old age (usually one's own home).

It is a story that is well-rehearsed and often-told and roughly follows what we get, when we take a look into ECRIM NEWS' special issue on Ambient Assisted Living (AAL). Here, already in the introduction, AAL is framed in regard to challenges that are very much located in a near-future:

> "Over the last 50 years, the number of older persons worldwide has tripled - and will more than triple again over the next 50-year period as the annual growth of the older population (1.9%) is significantly higher than that of the total population (1.02%). The European Commission has predicted that between 1995 and 2025 the UK alone will see a 44% rise in people over 60, while in the United States the baby-boomer generation which consists of about 76 million people [SIC] and is the largest group ever in the U.S., is heading towards retirement. This situation asks for new solutions towards improving the independence, the quality of life, and the active ageing of older citizens" (Pieper, Antona, & Cortés, 2011, 18).

In this respect, it is being promised that AAL-systems are framed as a technological fix to a far-reaching societal challenge (and "aging societies" is actually one of the societal-challenges-pillars of the Horizon 2020-program). As Takács/Hanák (2007) put it:

> "Facing these challenges and opportunities of aging societies in Europe […], technological and socio-economic innovation can enhance the quality of life of older and impaired people […]. Especially 'Ambient Assisted Living' (AAL) […] may greatly help in this situation. […] AAL can help […] to live longer at the place they like most, while ensuring a high quality of life, autonomy and security. This e. g. includes assistance to carry out daily activities, health and activity monitoring, enhancing safety and security, getting access to social, medical and emergency systems and facilitating social contacts" (Ibid., 34).

When it then comes to defining the very notion of Ambient Assisted Living, we quickly encounter a high ambivalence of the term. Ambient Assisted Living can mean everything and nothing (a great overview for the European research landscape on AAL is provided by Belbachir et al., 2010). Roughly speaking it accounts for technologies that are ought to assist elderly, their relatives and their carers (relatives, health care professionals, medical staff, and care service providers all are imagined to take this role, depending on the site of implementation for AAL technologies) in their daily lives and activities and their work as caregivers. A widely acknowledged take on defining "Ambient Assisted Living" is provided on the AAL Joint Program website.

> "The concept of Ambient Assisted Living is understood as: to extend the time people can live in their preferred environment by increasing their autonomy, self-confidence and mobility; to support maintaining health and functional capability of the elderly individuals, to promote a better and healthier lifestyle for individuals at risk; to enhance the security, to prevent social isolation and to support maintaining the multifunctional network around the individual; to support carers, families and care organisations; to increase the efficiency and productivity of used resources in the ageing societies" (AAL JP website[7]).

Yet, one has to be aware that the term itself is under constant negotiation – and understanding how the term "Ambient Assisted Living" gets attached with meaning in one instance of making its future is part of what this thesis will deal with. Associated with this constant negotiation of the term, its meaning and its future, are negotiations about, for example, the meaning of care, aging, technology and what being elderly entails. Yet, the definition provided by the Joint Program can serve as means for giving a rough sense of what AAL could mean.

2.1| Current research on ambient assisted living

This definition already reveals that AAL is a future-business and it is a business about futures: Not only is it perceived as one of the biggest markets of opportunity (cp. Tazari 2011, 142), but its general framing theme is dealing with an highly uncertain future that faces a wide-ranging number of challenges associated with what became coined as *demographic change* over the last couple of decades. It is the story of growing populations of elderly in need for care. A population dynamic that - although living longer, healthier lives is generally speaking first of all good news - gets associated with a range of challenges and problems; such as an increased demand for health care services, higher pressures on financing these public sectors, ensuring the quality of caring, new (job-) market dynamics, and so on. (cp. Sun et. al., 2009, 1201). This story of changing demographics and their challenges in caring for our elderly is the central means for framing (cp. Magjarevic, 2007 and Takács/Hanák, 2007) AAL-technologies.

This story gets rehearsed and re-told at almost any instance of introducing AAL to wider audiences, be it for justifying funding, legitimizing the relevance for developing new AAL-technologies or presenting findings at conferences. Almost any contribution on AAL that does not concern pure technicalities opens with using *demographic change* in one way or another as a means for contextualizing. Already a fast search in common literature-search-engines makes this justifying-logic graspable. And Mort, together with Roberts and Callén, makes aware of the logic that stands behind such rhetoric, already in introducing the article:

> "Rhetorics of the threats and burdens posed by ageing populations are increasingly ubiquitous and such discourse is frequently accompanied by stress on the imperatives of achieving efficiency and adopting new care technologies. In the context of austerity, it is important to situate the universalising rhetoric employed in policies on ageing in place and related technologies within specific socio-material arrangements and lived experiences. […] Remote care systems have recently proliferated in a largely market-driven context, underpinned by policies based on the understanding of ageing as a medical and economic problem. Such policies purport to promote 'healthy ageing' and 'ageing in place' but they also frame population ageing itself as a serious social burden" (Mort, Roberts, & Callén, 2013, 799).

[7] *http://www.aal-europe.eu/about/objectives/* - retrieved: January 22, 2015

Whit this in mind, it is easy to acknowledge the importance for asking for the roles of futures in the domain of Ambient Assisted Living. Yet current research on Ambient Assisted Living targets different questions and leaves aside the nonetheless dominating position for justifying AAL. We have a number of studies that deal with ethical concerns in regard to the implementation of Ambient Assisted Living raising mainly issues on privacy, data security and the concept of autonomy in highly technologized worlds (cp. Bachinger & Fuchs, 2013). Another branch of research then focused on legal questions in regard to AAL (cp. Ibid.), or focused on the concept of users as they get imagined, inscribed and black-boxed during development of new care-technologies (cp. Neven, 211). Another broad strand of research focused on potential and immanent consequences for care as a practice and social system, largely influenced by gerontological research and only taken up recently also by STS, as for example by Mol (et al., 2011) and Pols (& Moser, 2009; & Willems, 2011).

In STS itself there is a surprising lack of occupation with new technologies for eldercare although it seems obviously relevant for studies coming form this field, with STS potentially being able to contribute interesting insights in the study, development and implementation of new, complex technological systems in such sensitive and highly intimate worlds as the care of elderly represents. Besides studies from Mol, Moser and Pols (although more strongly focused on care then on technology), only a small number of studies have been published that are not accounted to technology assessment and technology acceptance. Here the recent special issue of the journal "technological forecasting and social change" on "science, technology and the 'grand challenge' of aging" (2015, vol. 93) is worthwhile mentioning opening up important questions on AAL coming from an STS perspective and raising important questions, such as the socio-material construction of late life, problem-formation, questions and limits of participatory design of AAL-robotics, co-constriction of care and technology and a section of lessons learned from STS and for technology design.

2.2| The striking lack of care for the future

This recent special issue then also marks the newfound and overdue interest of STS in AAL, yet it only can do so much and represents a mere starting point for STS-research in this field. More curious yet, is the still dominating neglect of the dominance of future-discourses in AAL for framing this new technology-market. And although Lassen (2015) points to some interesting aspects in regard to this issue, STS has still little to say on behalf of the role of future-discourses and the co-production of social and knowledge order in this regard. In the following I want to touch upon some key aspects of what has already been elaborated more generally on futures. Doing so, I want to open-up some key-questions that must be posed in regard to the role of futures for Ambient Assisted Living but where answers remain widely opaque so far (if there are any).

The role of futures in AAL remains widely un-addressed and we do not have any far-reaching and ambitions accounts for where the initial framing stories of "aging societies" and the "care crisis" come from and what spaces of action they may provide or restrict. Futures, as any framing of technology, function as coordinating-system: They provide meaning for those working with and using the given technologies. Yet, we know very little about what it means for e.g. technology developers to operate within a framing of AAL that embarks very specific wider societal issues. On the one hand, we can address the story built around AAL and *demographic change* in terms of providing justification and legitimization by stressing the wider social significance of developing new care technologies. This point is also made by Mort, Roberts, & Callén (2013, 799). Here the alarmist narrative of the "care crisis" could be interpreted as one to secure funding and to provide a framing for coordinated action. In this logic, the story of a highly uncertain future of aging societies is contrasted with the promise of providing a technological fix. In another publication, a case study on telecare and smart homes, Roberts and Mort put it in a nutshell:

> "Claims about unsustainable future demand on health services are supported by demographics […]. […] For policy makers and clinicians, telecare and smart homes appear to offer solutions to rising chronic demand while increasing monitoring (surveillance) and the speed of referral (efficiency) and health management decisions […]. Telecare technologies and smart home developments, in other words, constitute practical attempts to ameliorate the 'problems' of the aging population, increasing levels of chronic illness, rising demand for health and social care, shortage of staff and financial strains on health and welfare budgets" (Roberts & Mort, 2009, 140f).

We do not have clear answers for how this is achieved, nor how these fixes are shaped by the narrative framing of the futures at stake (neither how these futures potentially look like in detail). Yet, we have accounts for the importance of looking at the making of futures and their impacts on work practices and the shaping of technologies. The lack of reflection on the role of futures for AAL is the more striking in this context.

When focusing on futures in regard to Ambient Assisted Living, fundamental questions remain unknown and vague – already when asking for how "the future" is narrated, the answer is not at all clear. Although one can clearly identify the dominating theme of changing demographics, as described above, the concerns that get associated with it vary largely and span from concerns over economic dynamics, access to labor markets, affording treatment, or financing the health care sector to individual concerns on ensuring the quality of care in the backdrop of an increased demand for care services. In this respect, we can hardly make out one single future that is at stake when talking about AAL - there is not "the future" of AAL, and even less a "the future" of aging societies: Future-discourses framing new technologies for eldercare vary strongly and focus on individual as well as on broader societal concerns, and also in how these concerns get formulated. Again, this observation can only be based on indicators, due to the lack of a more systematic analysis. Interviews conducted in an earlier project reveal these strongly varying themes (cp. Bachinger & Fuchs, 2013).

This issue appears even more complex when acknowledging the awareness for the validity and power of promises of those engaged in promoting AAL. Again, we have little to no systematic

reflections dealing with the coping and managing strategies in promoting AAL, left alone making its future in this context. Looking at the strategies that were and are deployed in encouraging the participation in user trials in Austria, there are strong indicators for a high concern with how to promote and present AAL. Examples can be found in the discussions that are developed in regard to ethical concerns with the implementation of new technologies for eldercare (e.g. Remmers, 2010), where developers of AAL take them serious – at least in so far as they adapt their marketing and promising strategies. Another indicator is the reluctance in the acceptance of new technologies on the side of the elderlies and their relatives themselves (Zagler et al, 2008). In an earlier study I have argued together with Fuchs (Bachinger & Fuchs, 2013) for a shift occurring in justifying AAL: We observed in interviews with technology developers a strong awareness and concern for how to frame AAL in its promotion – triggered mainly by the difficulties in recruiting participants for their test-trials. This difficulty led to a shift in the promotion-strategy where a terminology of substitution (of care personal with technology) was changed to one of assistance and improvement (of technologies assisting care personal, improving their work without substituting them, making care work more efficient – a dynamic that also Mort, Roberts and Callén hinted at, as quoted above). In this respect, expectations and promises in regard to the future and AAL, potentially varies not only between cultural contexts (e.g. of care work, national health care systems or in regard to different technologies that get promoted and framed by them), but also over time. This observation suggests a highly dynamic process of making the future – to what consequences remains so far unclear.

In this regard, the lack of occupation with futures of Ambient Assisted Living seems striking - the more so, as STS offers a well-articulated analytical vocabulary for dealing with futures conceptually. Yet we still do not know what applying these tools to the specific case at stake provides: not only in regard to better understanding the making of AAL-futures and its consequences, but also in regard to what we can learn about futures and future-making more generally. This is drastic, given the relevance of futures in Ambient Assisted Living. As pointed out in the previous chapter in this section, futures appear to be the product of dynamic processes that bear far-reaching political implications; and STS' occupation with futures poses important questions that seek to carve out these very political aspects. Breaking them down to Ambient Assisted Living as one case where futures are made, get mobilized, are contested and incorporated, the relevance for asking these questions becomes striking - and the absence of studies doing so is striking even more so. It remains unclear what futures get mobilized, who is involved in making them and to what consequences they do so.

2.3| Some key questions for an STS-inquiry in AAL and its future(s)

We need to acknowledge the impacts of futures on technological development and implementation. In this respect, it should be a strong priority for STS-research on AAL to ask for who is – how - making which futures, on what conditions, and to what ends: Who is able to

participate in making futures, and who is excluded? How are the technologies shaped by these established and/or withdrawn future-visions and –expectations? How, then, are spaces for action opened-up and closed-down, e.g. where – and in regard to what future-vision and associated challenges – does it make sense to implement AAL, for what users are they constructed, and for whom living in which settings? And what does this mean for our understanding of care as practice?

Asking these and related questions seems even more urging, given the highly personal and intimate areas of implementation of AAL-technologies, as they are ought to operate in health-care settings and thus in highly privatized and intimate worlds. Carving out the impacts of futures, and the conditions of their making, has then a high political relevance: Dealing with futures on Ambient Assisted Living means also opening up questions of e.g. how - in context of new technologies for caring - we want and can understand care and care-practices, health and normalcy; what we want to understand as successful aging and what being elderly entails, or what we address as 'societal challenges'. Making the future of Ambient Assisted Living frames the meaning of this very term: in regard to the technologies, their modes of implementation, the problems they are ought to address and resolve and the meanings we associated with it – involving health, care, aging, etc. I previously pointed to the power of futures for opening-up and closing-down capacities to act. This study seeks to make first courageous steps in dealing with these questions, and is a first take on how we can understand futures of eldercare-technologies and their making. Yet, it cannot provide a fully developed picture of the role of futures in and for Ambient Assisted Living (and be it just because of the ambivalence of the term itself). Rather it is the take on one concrete case, that allows fostering our understanding of futures in-the-making and their impacts on making AAL in but one concrete context.

In this contribution I will take the quote of Brown, introducing this chapter, serious. I will analyze the politics of future-promises by *looking at* the future and how it is utilized in the *present* - and how it gets rhetorically and visually organized as a resource. A set of corporate-videos, published by the Center for Aging Services Technologies and promoting a specific range of AAL-technologies, will provide the case for analysis. Doing so, I seek for carving out the rhetoric and visual practices of futures for framing wider societal problems, assembling different actors, and introducing a specific notion of AAL, in order to give meaning to future-visions of Ambient Assisted Living – and in the end to give meaning to the term itself and what it may entails. Which associations between actors are established, by addressing future-challenges and problems, and in which ways gives this meaning to the technological application of AAL? I apply a co-productionist understanding of futures, where social and technological orders are mutually constituted in materializing "the future of" Ambient Assisted Living. I will show that, drawing on moral values and social norms in the backdrop of a future vision of technologically assisted aging, visuals and rhetoric serve not only to depict a technology, but to provide a definition of what the technology could mean as a socio-technical assemblage, in the backdrop of a problem that gets

only established by telling "the future" in specific ways. How, then, are social and technological orders arranged in making the future is the key question of this study. I want to bring forward the fine-grained acts of establishing futures of as specific vision of Ambient Assisted Living; one that I will call "High-Tech Aging". This study is then a first take on the role of futures within Ambient Assisted Living, focusing on one specific site for making one of its futures, opening up an urging question on the politics of futures in and for AAL.

This publication is, then, situated within three major strands of research in STS: (1) Reflections on the visual and depictions of science and technology and their role in manifesting, facilitating and shaping the understandings of science and technology. (2) Initial works on futures seeking to provide a better understanding of projections and scenarios and their seminal political role in building on and towards scientific and technological innovation. And (3) works in the field of AAL and present potential transformations of care *as practice* and *in practice*.

All this makes up the intrinsically political dimension of the questions I seek to raise. That of "How are social and technological orders co-produced in making the future in CAST's corporate videos of Ambient Assisted Living (AAL)?"

Chapter 2: Case Description

PROMOTING FUTURES: CAST'S CORPORATE VIDEOS

In this section I am presenting the case resting at the heart of this study. I am going to introduce the videos that get analyzed and further argue for how CAST utilizes them as to indeed establish a specific future vision. This will allow me to argue for the relevance of this case and why it is a worthwhile subject to study, granting the opportunity to address key questions in regard to future-making and its relevance for promoting and framing Ambient Assisted Living.

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> "The physical therapy regimen will have her home soon. Once she's there her care plan consists of three components. One - Telehealth: Alma's doctors will be able to monitor her remotely. Two - in home sensors detect if she's declining or needs assistance. And three - A sleep monitor. This really helps us detect problems early. Oh - In addition Alma will have a personal emergency response system that can automatically detect falls. These systems help alert her caregivers right away. This really is the future of aging (Michael Campbell; In: LeadingAge CAST, 2012a).

Michael Campbell, quoted above, is a nurse manager in LeadingAge CAST's fictional story about Alma, an 83-years old woman, suffering from a stroke and striving to get back to normal. Alma, as well as Campbell, are both characters in CAST's promotional corporate video "High Tech Aging: Improving Lives Today" (LeadingAge CAST, 2012a). This video imagines a future of improved care through technological innovations: sleep monitors, emergency response devices, fall detectors, telehealth-devices – they all step in to help take care of the film's main character, the 83-year-old Alma Jones. It is a future that promises improved aging on the elderly's own terms, one about (as Alma's Daughter coins it[8]:) "taking charge of ones aging". Technology, as Campbell explains, in this video "really is the future of aging".

The video "High Tech Aging" (LeadingAge Cast, 2012) was published in December 2012 on the Website of the Center for Aging Services Technologies (CAST) - one of four "centers" of the LeadingAge[9] network of not-for-profit organizations, based in the US – as a renewed and updated version of the video "Imagine: The Future of Aging" (LeadingAge Cast, 2005). This previous version tells the story of Ernesto, also beyond his 80s, as he encounters challenges and problems while growing old, and that of his family, as they increasingly are swamped with caring for Ernesto. Just as in the story of Alma, it is technology stepping in that solves the different

[8] Leading Age Cast (2012a), 01:43 – 01:45

[9] LeadingAge is a network of not-for-profit organizations operating in all domains of health and eldercare, assembling care service providers, policy advocates, research facilities and state partners, but also businesses, consumer organizations and technology-companies. In this, LeadingAge is a central actor in the US health care system, aiming at influencing health-care markets as well as public health policies.

problems that get associated with Ernesto's and his family's struggles: e.g. health impairments, disabilities, time consuming caring, and inefficiencies in providing care and medical treatment.

What gets portrayed in the corporate videos of CAST is a highly technological future; a future that imagines technology to be key to solving problems of an *aging society*, where the so-called *demographic change* gets associated with specific problems on individual as well as on structural and societal levels. In "High Tech Aging", just as in "Imagine: The Future of Aging", CAST sketches a future that, in a first impression, is one about technologies, more precisely Ambient-Assisted-Living-technologies ("AAL", or AAT when more specifically referring to technological applications per se).

But is it a mere "technological" future that gets drawn up in CAST's videos? What about nurses, medical experts, families and the elderly themselves? They are all - humans and technological devices - deeply intertwined, as they seek to achieve improving Alma's aging: Bringing together society and technology is presented by the CAST in their promotional films as the key to unlocking their vision of a future of aging. But is this future really one about technologies only? Or should we not rather understand it as a construction of futures that involves different actors (humans just as much as the technical ends of what makes up Ambient Assisted Living) all interrelated and specifically arranged? Shouldn't we rather apply a co-productionist take on the future established in the videos; as– with Jasanoff (forthcoming, 6) "scientific and technological visions" that "enter into the assemblages of materiality, meaning and morality that constitute robust forms of social life" (Ibid.)? In this notion the videos appear more complex than the initial impression of the videos as mere depiction of technologies would suggest.

As the future of "Ambient Assisted Living" (AAL) is being told, turning to the promotional corporate videos on new technologies in eldercare builds on the understanding of futures as politically colonized spaces, where the videos are but one specific site for doing so. A large range of STS thinking about futures shows them playing an important role in facilitating norms and moral values associated with innovation technologies. Futures in these contributions (cf. e.g. Borup et al, 2006; Brown & Michael, 2003; Kirby, 2009; Jasanoff, forthcoming) are characterized as spaces that are colonized and instrumentalized, where presents and pasts become projected and where ideals get formulated and facilitated, playing a seminal role in creating "investment" in the development and implementation of new technologies.

The videos can be understood as a demonstration and re-enactment of what ought to become shared beliefs, norms, and moral values associated with the technology at stake, as suggested in the sociology of expectation's analysis of the role of making future-promises and framing expectations of "the future". It depicts futures, and animates them with norms and social orders. The video becomes a technology of *framing* (cp. Nisbet and Mooney, 2007) the future to accomplish political aims: It deliberately assembles actors (human and non human), constructs relations between them and brings together social and technological (knowledge) orders in order to mobilize stakeholders (technology developers, care service providers, end-users, political

stakeholders, etc.), create their investment, and secure resources for the realization of the promised future. In the initial statement regarding the video on CAST's website, its aim to frame "the future" in order to use it politically becomes evident:

> "LeadingAge CAST has just released, 'High-Tech Aging: Improving Lives Today', a vision video that shows how current technology can facilitate coordinated care and aging in place. The video demonstrates the possibilities through the story of Alma, an 83-year-old woman whose journey from home to hospital, rehabilitation and back home is assisted by technology" (LeadingAge Cast, 2012b).

This is in-line with the official statement on CAST's policy:

> "The LeadingAge Center for Aging Services Technologies (CAST) is leading the charge to expedite the development, evaluation and adoption of emerging technologies that can improve the aging experience. CAST has become an international coalition of more than 400 technology companies, aging services organizations, research universities, and government representatives." (LeadingAge Cast, n.d.b)

With CAST being an "international coalition" aiming at bringing together stakeholders and aligning them to realize a common goal (" [...] to expedite the development, evaluation and adoption of emerging technologies [...]"), (promotional) videos are perceived as crucial medium for creating shared interests. For introducing the 2005 "Imagine: the Future of Aging", (LeadingAge CAST, 2005) and an accompanying "user guide" for bringing the video to a "best use" CAST explains on their website:

> "This introductory video discussion guide, designed specifically for aging services providers, describes the technologies shown in the video and offers suggestions of ways to use this powerful media tool" (LeadingAge Cast, 2011).

And further:

> "What we need is a national strategic plan — one that brings together leaders from industry, government, health care, research, and consumer advocacy — to prepare for the aging of our population. [...] Fortunately, exciting new technologies coming in the next 5-10 years offer the potential to dramatically improve the quality of care we can provide. We can and must make it happen through vision, leadership, and national commitment to prepare for the demographic and economic changes that will inevitably transform our swiftly aging planet" (Ibid.).

CAST here is clearly aiming at enlisting stakeholders ("leaders from industry, government, health care, research, and consumer advocacy") to realize a common goal by joining the association, or at least collaborating with it. This shared goal is defined as "preparing for the aging of our population" - through the development and implementation of "new technologies [...] [that] offer the potential to dramatically improve the quality of care we can provide". After all, this is seen as only to be realized through "vision, leadership, and national commitment" – associating commitment with responsibility ("We *can* and *must* make it happen" [Emphasis added]). This rhetoric aims at establishing collective, institutionally stabilized, and publicly performed visions of desirable futures: To realize a future of technologically improved care (=desirable future), the stakeholders are ought to be tempted to *committing* to the realization of this *shared belief* of how to improve care and aging (not the association of "can" and "must" as seen in the quote above!).

This impression is further fostered in the 2012's video's introductory on-screen-text:

> "Older Americans receive *poorly* coordinated care. Health professionals communicate inefficiently, creating *redundancy* and *errors*. Our country spends *trillions of dollars* to receive sub-par quality and disjointed care. Is this problem *impossible* to solve? Not at all… And *technology* is part of the *solution*" (LeadingAge Cast, 2012a, 00:00 – 00:24)

And further, this on-screen-text concludes the video:

> "Create partnerships between hospitals, physicians, and aging services to make coordinated care *possible*. Work with your partners and payers on business models that cover technology-enabled care across settings Joint the Center for Aging services Technologies and use its resource" (Ibid., 07:01 – 07:24).

CAST again applies a rhetoric of enlisting stakeholders, as it is made especially explicit in the concluding text at the end of the video. Here, the organization is explicitly mentioned as the key actor in the network: *'Join CAST to realize our common goals!'* appears to be the central message here. This is embedded in a future-vision where technology becomes characterized as the solution in the backdrop of a problem: that of challenges in caring for the elderly[10].

This hints to the videos being clearly perceived as a tool for establishing a wishful future that is to be *collaboratively* achieved. The video then becomes a crucial stage for constituting a shared aim that is projected into the future – and thus where the political efforts for making futures of *High-Tech Aging*[11] become tangible. So what, precisely, are these efforts that are employed in the video to make the future of *High-Tech Aging?* How can "the future" in the case of CAST's promotional corporate videos then be understood?

When watching the respective stories of Alma and Ernesto, it becomes necessary to understand the videos as a specific site where technologies and humans get intertwined and entangled in order to manifest CAST's vision of "the future". It is then crucial to ask two fundamental questions: What is this future, really, that CAST develops and presents in their videos? And how is this – or rather: how are these – future(s) made, in their visual and rhetoric establishment? Starting off with this question, this study seeks to shed light on the future-(textual as well as visual) rhetoric of CAST, in the videos - and beyond (i.e. their website as a key space that the videos get shown in). This makes it necessary to understand CAST itself, as an actor with its own identity, (political) aims and interests informing the production and facilitation of its future-visions. This study thus does not only ask for what these futures are that the videos facilitate. It

[10] Note also the clearly nationalized context: Older *Americans* are in focus, with trillions of (U.S.) *dollars* being inefficiently wasted.

[11] Although the videos seems to be primarily a representation of technology, they instead represent technology *in society*. Speaking of "the future *of innovation technologies in eldercare*" appears to be short-sighted in its terminology and conceptual framing. Through the lens of co-production (technology gains its social dimension: Broadening the conceptual framing then allows speaking about future-making in a much wider sense; one about caring for elderly, assisted by innovation technologies, and involving a number of actors specifically arranged within their social realities. Only in such a conception the act of future-making appears meaningful. Borrowed from the title of the video, "High-Tech Aging: Improving Lives Today", I will take this wider perspective into account by speaking of "making the future of *High-Tech Aging*"[11] rather than that of e.g. "Ambient Assisted Living". I will henceforth write "High-Tech Aging" in italics, as this term comes from the materials themselves. Taking over this term makes sense exactly because it is coined by the publishers of the videos. But one has to treat this term with caution, as calling something „high-tech" already frames it as being a technological advanced and is often associated with improvement.

also asks for how they are made, who makes them, with which means, and to what ends. In this, this study presents a co-productionist take on futures, one where it becomes crucial to ask: "How are social and technological orders co-produced in making the future in CAST's corporate videos of Ambient Assisted Living (AAL)?"

This question can be applied in two ways: In regards to the futures themselves, where it is crucial to carve out the social and technological (knowledge) orders that get co-produced in making them. This has important consequences for whose and what futures are being made in the videos. It is the clear-cut understanding of the author that the presented futures about technology stepping in cannot be solely technological futures. Technologies themselves make only sense within the social context they get applied in, just as the social settings evolve around the technologies that are depicted in the videos. Only in thinking "the social" and "the technological" together, one can arrive at a more powerful explication of the futures constructed in the videos. The first focus of this study is then to understand "the future of Ambient Assisted Living" through this co-productionist take, where Ambient Assisted Living involves technologies, humans, and knowledge orders (e.g. how "aging", "health", etc. is applied as a epistemological concept in the videos); and where its future only makes sense when thinking about these elements together.

The second focus lies on the making of these futures: Here it becomes crucial to understand CAST as a politically[12] motivated actor that strategically shapes the developed futures alongside its own aims, understandings, and ideologies. It is thus key to understand CAST as an actor - but also the media used for facilitating and establishing the future-visions - and the social realms CAST is acting in: e.g. the US health-care-system with its own logics and systematically organization.

Only when applying this two-fold perspective in making the future: both, *in* and *through* the videos; only when applying these perspectives does it become possible to arrive at a broader, more fine-grained understanding of how what kind of futures are made in this specific case and at this specific site for making AAL-futures. Doing so, this case will allow two things: 1) to gain a deeper understanding of how one specific actor strategically utilizes futures for its own aims; how futures are made in one specific instance. And 2) to understand at least one specific aspect of the roles of futures in the newly developing field of Ambient Assisted Living, with its own logics and rhetoric for framing technologies through futures.

The initial case for this study is built around the two videos published by CAST, in 2005 and 2012 respectively. CAST has released different versions of the respective videos: A longer version and a shorter one for both video-corpora. The focus here rests on the longer versions of the videos, as the short versions take a less important role in making and promoting CAST's future (as it mainly refers to the longer versions itself). Additionally CAST published accompanying documents for both corpora – "user-guides" providing background information on the depicted technologies and information offering "suggestions of ways to use this powerful media tool" (LeadingAge CAST

[12] in a wider conception, not only restricted to polity.

2011). These videos and accompanying information materials represent the heart of the case for this study. Yet, understanding the publishing organization CAST is crucial for a powerful analysis of the videos. Thus, additional information on CAST and LeadingAge, its policies and aims, members, and its organization is secured in form of yearly activity reports, policy publications, press releases, and other materials on CAST and LeadingAge, made accessible through their websites[13].

[13] LeadingAge: *http://www.leadingage.org*, CAST: *http://www.leadingage.org/CAST.aspx*

Chapter 3: Research Question

TAMING FUTURES: AN INVESTIGATION INTO TIME AND SPACE

This chapter is dedicated to discussing my research question and substantiating it by outlining key terminological and conceptual aspects that feed into it, before turning to discussing the sub-questions that provide a further specification of the aspects I want to address in this study.

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Making and representing techno-futures of aging must be understood as a highly political act of framing eldercare-technologies within specific contexts of social orders. Sociotechnical expectations materialize in visualizing a vision of "the future" through the co-production of social and knowledge-orders: As futures themselves are made in specific social contexts, for certain audiences, and by drawing on specific knowledge orders; and, as the depicted future presents itself in the video as a socio-technical hybrid of eldercare-technologies, those whom they are supposed to support and assist and those who work with them. These twofold entanglements are at the core of this investigation, which aims at understanding what "the future" of AAL in the vision of CAST's corporate films is, how it is made, by and for whom, and how these future-visions materialize meaningfully for those who work with and incorporate them. This study thus asks:

How are knowledge/technological orders and
social orders co-produced in making the future of
Ambient Assisted Living (AAL) in CAST'S corporate films?

By analyzing CASTs corporate films, this study asks for (a) how technological and social orders are co-produced in their representation *in* these videos in order to manifest a future-vision of caring-technologies, facilitated through what is performed as technological innovation; and for (b) how these futures are organized as to promote CAST's technological fix in the backdrop of establishing representations of aging in problematic and negative framings. In the following I am going to provide some conceptual and terminological clarification before specifying my research question via the formulation of sub-questions.

Some Terminological Clarifications

The terms *caring-technologies*, *eldercare-technologies* and *Ambient Assisted Living* are used interchangeable here. This is due to a reluctance to go anywhere beyond the initial definition of AAL in the previous chapter *a priori* to the analysis of the videos. It does not make sense; in so far, as CAST, through the videos, to only establish their understanding and vision of AAL *in the making of the future*. It is one task of this study to carve out what making the future of Ambient Assisted Living entails for the term and concept itself. Generally speaking, I further the usage of the terms caring-technologies, eldercare-technologies, or simply technologies (and similar variations) for the technological aspects of AAL themselves - be they "simpler" devices, such as sensors, tablet computers, telecare-applications, etc., or more complex technological realizations involving several devices in order to provide a technological solution to a given problem (such as smart home devices consisting of various sensors, processing units, interfaces, etc.). The term *Ambient Assisted Living* however is not restricted to purely technological applications: Rather it is a place-holder for whatever it is that gets envisioned by CAST as a socio-technical arrangement. "AAL" is not restricted to its purely technological dimensions: It involves carers, the elderly and their relatives, medical professionals, social orders, moral values, and institutional settings. It only gains its full meaning by thinking about "the social" and "the technological" together. I suggest treating AAL as a socio-technical hybrid, or assemblage, following Latour (1993).

As a whole, I follow the previously given definition that conceptualizes AAL as technologically assisted caring – which is also the major theme of CAST's corporate film and therefore its usage makes sense. Yet, this can only be the starting point. This definition is in itself purely political: it frames the term as one of technological intervention, where "the social" only gets transformed, yet hardly acts. CAST is establishing a very specific vision of AAL and this study seeks to provide a fine-grained understanding of it, what it entails when applied, and how it is made in constituting its futures. One thus must use this term carefully, due to its general ambivalence and specific translation within the case of this study. It must not be confused with a general, absolute definition of AAL, but with one that is made in a specific context, for a specific audience and in the backdrop of specific aims and institutional/organizational logics of its makers, CAST. Although starting-off with the technological view on the term AAL, I do so only as it is a means for entering the field. I start-off with this perspective, only to dis-mantle it, to abandon it and relieve myself from a conception of AAL, where one could understand "the technological" apart from "the social", and vice versa. As this specific vision of CAST on AAL will be rendered more precisely through the course of this investigation, a new and better-suiting term for what the future is about, that CAST is making in its videos will be provided. For now, I will use AAL as a proposition for a working-conception of what future CAST is making: one where the focus seemingly rests upon the technology. Yet I will do so, only to abandon it, to show its limits, what it hides and what it makes visible. Focusing on the co-production of social, knowledge, and technological orders, I want to follow also ANT's understanding of social materiality in a perspective of assemblage.

This further clarifies my research question. While CAST's *Ambient Assisted Living* must be understood as an assemblage, it has to be clear that it is a very specific kind of assemblage: One that exists, first of all, virtually. It is not out there, in a material form, implemented at the homes of the elderly, in caring facilities, or in hospitals. As far as it goes for this study, this specific assemblage exists only in the virtual realms of CAST's video. There is no access to those watching the videos – no information is given in how far others take this assemblage serious (although there is some strong indication for this, as outlined in chapter 3).

It gets even more important, then, to ask for how this assemblage is materialized by CAST: How is it made, drawing on which norms and moral values? Who is its maker and how is this reflected in the make-up of the vision of AAL? To whom is it directed, aiming at what? When CAST is making the future of Ambient Assisted Living, the question of how social, knowledge and technological orders are co-produced embarks in two crucial dimensions: that of the vision itself, in the videos; and that of its making through CAST.

Conceptual Remarks: Research Questions in a Co-Productionist Perspective

Co-production, with Jasanoff (2004a, 2), is "[…] shorthand for the proposition that the ways in which we know and represent the world (both nature and society) are inseparable from the ways in which we choose to live in it. Knowledge and its *material embodiments* [emphasis added] are at once product of social work and constitutive of forms of social life; […]". In this perspective, when encountering representations of eldercare-technologies in the videos as "material embodiments" of knowledge are shown to be deeply intertwined with the social – more than this: imagining technology apart from society blends out their (re-)constitutional power for social orders as much as their own shaping by them. Technologies, in a co-productionist take, shape society and are entrenched in it. Thus, the representation of AAL cannot be fully grasped without also analyzing how they are depicted in a wider social context. It thus becomes crucial to ask for

- … where[14] such technologies are shown to be implemented, which problems they are depicted to address and are intended to solve and how its user(s) are imagined (compare e.g. Akrich 1992; Jasanoff (forthcoming); Brown et al. 2000, from there especially: Michael (in Ibid., p. 21-42); Brown & Michael 2003);…
- … one, conversely, cannot understand the concepts of e.g. "the user", "care" (and to that effect: health) as they are performed in the video, without the technological setting, these concepts get applied and shaped in; and …
- … CAST's vision of the future of AAL(-technologies) can also not be fully grasped without understanding the social orders their depiction emerged from (e.g. How CAST understands care to be organized, how the R&DT-landscape is organized and what are viewed by CAST as key stakeholders for realizing its future-visions, and particularly, how

[14] „Where" – not to be understood only in a pure geographic sense, but also meaning: in which network (for more details: chapter 4: Sensitizing concepts)

> LeadingAge (and CAST) can be understood as organization with its members, aims, social orders and knowledge culture …) (see Jasanoff (forthcoming) and Jasanoff 2004),

They are two sides of the coin - brought together, mixt, entangled and intertwined, interwoven and connected to what then becomes a hybrid: Making the future of Ambient Assisted Living is then much more then "just" making a future of technology. It also addresses e.g. caregivers, service providers, or the elderly themselves, and is deeply rooted in the social.

When I thus ask for how social and technological orders are co-produced *in* the videos, I build on the notion of co-production. In this sense, the videos do not only "make the future of AAL". Rather, they construct futures of deeply intertwined social and technological orders brought and thought about together. What emerges are scenarios of imaginations that not only construct technologies, but also their potential functions: Rather, making the future of AAL entails also making the future of the social orders the technologies are embedded in: Of caring as a techno-social practice, and of the associations of the various actors involved in caring through the assistance of innovation technologies.

„The future" must be understood as one a *site* of co-production, where techno-social orders are imagined, manifested, and stabilized. This facilitates an understanding of co-production *in* making futures: The future is not a fixed temporality of what to come, but – with e.g. Brown & Michael (2003), Adam & Groves (2007), and Brown et al (2000) – open spaces deliberately colonized with meaning.

Then, approaching AAL must be turned upside down. Although the videos seem to be primarily a representation of technology, I rather want to analyze them as performances of technology *in society*. A "future *of AAL*" appears to be shortsighted in its conceptual framing. Through the lens of co-production technology gains its social dimension: Broadening the conceptual framing then allows speaking about future-making in a much wider sense; one about caring for the elderly, assisted by technologies, and involving a number of actors specifically arranged within their social realities. Only in such a conception does AAL and making its future appear meaningful.

Sub Questions

These conceptual remarks direct towards further perspectival implications. For one, understanding how Ambient Assisted Living is conceptualized demands focusing on the central concepts of the social and technological and their interrelations. How is e.g. care depicted, involving which actors and drawing on which values and ideals? What role is assigned to technology in the depicted future(s) of care(ing)? What ideals of aging, health and healthy behavior get mobilized in this depiction? Inductively identifying and carving out central social and technological orders is crucial in understanding the techno-futures made in the videos. As these conceptions are embedded in a wider narrative, its overall organization must be analytically dissected before turning to single conceptions. For this, asking for the overall narrative of "the future" at stake is crucial.

Therefore, this study raises three sub-questions that address different aspects of CAST's efforts in establishing its future-vision:

1) **How are late life, CAST's technological fix, and care staged and organized within the video in order to substantiate and establish these promoted futures?**

   Here I ask for the means of representations of the respective subjacent concepts of late life, Ambient Assisted Living, and care. I am interested in the means for representing and framing these concepts and how they are interrelated. For this I am going to discuss in the first chapters of my analysis the different rhetoric and visual repertoires CAST uses for substantiating and facilitating its understanding and interpretations of late life, Ambient Assisted Living and care, respectively, and I also will discuss how the staging of the one feeds into and co-constitutes the framing and staging of the respective other two. I put forward a co-productionist understanding by doing so, as I am arguing for a mutual forming of the three different concepts: Understanding the technological fix, for example, can only be substantially discussed when first understanding how problems and challenges get formulated and imagined and where they get located. As I am going to argue, the representations of late life in terms of a deficit logic only establish the means for framing and presenting CAST's technological fix. On the other hand the problem of deficit late life, in turn, is accordingly staged as to support the technological fix.

2) **How does CAST imagine, stage, and perform its future-vision in regard to the different actors in the videos?**

   I then am going to discuss, built on the answers to the first sub-question, how CAST establishes its future-visions in order to make them matter for different actors that are deemed crucial for its realization. Here I will utilize what Callon has suggested as the analytical approach of ANT's sociology of translation: I will thus ask for how CAST attempts to align different actors towards its techno-future and how these endeavors of alignment facilitate a re-definition of the different actor's identities. I am going to address this question throughout my analysis and particularly carve out key aspects to my suggested answer in chapter 10. Simultaneously, this question entails to ask for CAST's orchestration of its vision of the future as to achieve this alignment in the first place. Therefore I will argue for similar means of framing the future, as suggested in Callon's analysis in his sociology of translation (Callon, 1986): I will ask for the problems CAST is attempting to formulate in order to provide a framing of AAL as technological fix, simultaneously establishing it as an obligatory passage point for overcoming this problem. Doing so, I will carve out the powerful rhetoric of a deficit model of late life that is addressed by providing a technological fix to these deficits and how this then allows CAST to establish itself as the central actor for achieving this OPP (Obligatory Passage Point.

3) **How do wider social norms and values feed into the establishment of CAST's techno-future?**

Finally, I am going to argue that CAST needs to mobilize wider social norms and values to construct its vision as wishful and necessary in order to be achieved. I thus ask for these norms and values, what they are, and how they get incorporated and utilized in the establishment of the techno-futures promoted by CAST. Yet, I also am going to argue for these social norms and values to not remain the same while being incorporated by CAST, but rather get transformed and re-specified as to "fit" its vision and support it. To do so, I am going to situate CAST as a social actor with its specific position within the social fabric that is the US eldercare sector. This then allows understanding how the specific social identity of CAST impacts the way it imagines its future and feeds into its framing and formulation.

Asking these sub-questions, means asking for how technological and social orders are co-produced. Thus, how AAL is imagined to work, what it is made to promise and how it is set-up and made up can only be understood in context of how "the social" gets imagined, staged and outlined. Contrariwise, the social orders also must be understood as being made in certain ways so to understand and legitimize the technology itself. Both must be thought of as together: The orders that provide the social context for the technological applications themselves are depicted in such ways as to support the technological devices and give them meaning. The over-arching research question thus asks for how one has to think the subjacent concepts together, how they provide meaning for each other, and how they are themselves rooted in CAST's interpretations of wider social realities that get inscribed and rehearsed in the videos constituting these future visions.

Just as the videos produce the future of AAL, the videos themselves are produced. It is thus important how CAST itself must be understood as an actor that puts so much efforts in making AAL's future(s). This will shed light on the video's contents as well: CAST operates in specific social settings, national health-care-systems and political contexts. It addresses certain target-groups and stakeholders and follows its own institutional logics and aims. CAST itself is a social assemblage of different actors with their own roles and identities. The organization's values, norms and aims and goals are crucial for in the shaping of the video's and how the future of AAL is organized rhetorically and visually.

Chapter 4: Theories and Sensitizing Concepts

CONCEPTUALIZATIONS OF USERS AND TECHNOLOGIES IN TERMS OF CO-PRODUCTION AND ANT

"By all means, they seem to say, let us not mix up knowledge, interest, justice and power. Let us not mix up heaven and earth, the global stage and the local scene, the human and the nonhuman. 'But these imbroglios do the mixing,' you'll say, 'they weave our world together!' 'Act as if they didn't exist' the analyst reply. They have cut the Gordian knot with a well-honed sword. The shaft is broken: on the left, they have put knowledge of things; on the right, power and human politics" (Latour, 1993, 3).

This chapter is dedicated to providing a narrower understanding of the key theories and sensitizing concepts that shape the focus of this study and are important vehicles for my analysis. I am going to provide a clarification of the understanding of "users" as well as "technologies" that feed into this study, and also am going to address how the theoretical approaches of co-production and actor-network theory inform the research-approach of this work.

I am going to address first the conceptualization of users by discussing different takes on the issue. I then will turn to technologies and how I conceptualize them, drawing on what ANT and particularly Latour, Law, and Akrich have to say on this topic. Following this, I am going to discuss the theoretical frameworks of ANT and co-production respectively as they are centrally shaping the approach applied to this study.

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1| Conceptualizing Users and Technologies

Conceptualizations of users and technologies are strongly interrelated, as the understanding of the one is strongly tied to the other. Thus, although focusing on the respective aspects of the user or the technology separately, I will obviously have to partially discuss them together. I will first turn to conceptualizing "the user", and already here I will touch upon some attempts of understanding the technologies these "users" are, well, "using". After having clarified the understanding of "users" put forward here, I will then more strongly focus on technologies and explain how my take on "users" is tied to that of their "technological counterparts" and, whether differentiating between users and technologies makes sense beyond their conceptual discussion (I will argue that it does not).

1.1| Conceptualizing Users

What is a user? The answer appears ordinary: It is a person that uses technologies – thus its user. Yet, this assumes a linear understanding of the relationship of user, technology and its designer. The traditional linear-model (Godin, 2006) of technological innovation largely builds on this conception and suggests an uncomplicated relationship of the three. Simply put, it stands for the linear process of technology development where the developer comes first and the user last: The designer(s), maybe having an epiphany, sits down and comes up with a new technological solution to a problem - starting off the process of technology development. Once completed, a ready-to-use new device is "born" and becomes fit to enter into application. The user is the one that just takes up the device and uses it. And even if he or she doesn't, this is solely a matter of misconception of the technology, bad means of diffusion (and thus "education" of the user on what the technology is and how it is ought to be used) or the result of "unfortunate" market dynamics. For the linear model designers have a sheer omnipotence over their invention and its design and the user just accepts the final product or doesn't. Potential complications are issues of fitting technologies and users together, of technology assessment, and user economics.

STS criticizes this deficit-logic of science communication, and Neven (2011, 24ff) gives a compelling overview of discussions on that matter, particularly in respect to strands of STS-works inspired by a semiotic approaching of users. Here the answer to the question "What is a user?" appears more complex. One cannot – this is the main argument – simply differentiate between technologies, designers and users. Their relationship is just too convoluted. So how is "the user" to be (better) understood? And what does it imply for the understanding of my research question? Some considerations are necessary. I agree with Neven: "Underlying these ideas is a rejection of the view that users and technology should be treated as separate objects of research" (Ibid., 24).

When conceptualizing the user (and for that matter, technologies and designers as well), I follow three main approaches within semiotic-inspired thinking in STS, as suggested by Neven: "The central concepts in this tradition are 'configuring the user' (Woolgar, 1991), 'user representations' (Akrich, 1995) and 'scripts' (Akrich, 1992; Akrich & Latour, 1992)" (Neven, 2011, 25).

One of the first (Neven, 2011, 25) to take up the problem was Woolgar (1990): "This paper is a preliminary attempt to play against one specific aspect of the machine text metaphor: the notion of the reader as user. […] [T]he 1980s have seen considerable attention devoted to 'the problem of the user' amongst the designers and computer systems. This paper takes the line that the emergence of a new range of microcomputers crucially entails the definition, delineation and emergence of The User" (Ibid., 61). The key argument is that entities (e.g. technologies) are a matter of boundedness constituted in the views about other entities and their relationships:

> "For convenience, we can refer to any existing complex of relationships between entities as the moral order of representation. It is a world view which embodies notions about the character and capacity of different entities, the relationship between them, their relative boundedness, and the associated patterns of rights and responsibilities. Linking all these are sanctioned procedures for representation" (Ibid., 66).

This argument is the basis ("The earlier discussion of attribution and boundedness in entities suggests we start from the position that the machine can only be understood in terms of its relationship with other entities and its phenomenal world"; Ibid., 67) of his bigger point on user-technology-designer-relationships. With Woolgar, stressing the need for understanding the different entities' relationship should not be misunderstood as a calling for understanding technologies in their context. Rather technology and context become part of the same and cannot be understood separately. The machine only makes sense in the context of application (who is using it where and for what; "the context" here is equated with "the user", cp. Ibid.) and understanding the machine-context "derives from a sense of the machine in its context. The sense of context and machine mutually elaborate each other" (Ibid., 67). In this, interpreting the context (its reading) becomes essential – and for Woolgar the composition of the machine (or in his metaphor: text) is key for demarking possible and impossible interpretations.

Yet, this conception places strong agency in the hands of the designer. Woolgar's approach has been convincingly criticized for being one-sided and putting too strong of a notion on the designer that interprets and imagines potential users and designs the machine accordingly, inscribing concrete forms of applications (and thus representations of the user). Yet, this approach was breaking new grounds in its time, as it tries to overcome the then-dominating linear-differentiation of users, technologies and designers in their disconnectedness: One cannot think the designer apart from the user, and even less so the technology. The subsequent entering of designers, technologies and users (in an procedural evolution of technologies) cannot be accepted in this reading suggested by Woolgar and re-connects the different actors: Only in bringing them together, machines make sense, as they draw on their mutual constitution and interpretation.

The omnipotence of the designer, as it is the case for Woolgar', is a valid criticism, and Akrich offers a way out. She re-distributes agency fundamentally, and Woolgar's machine-text-metaphor can be extended here. Akrich's concepts of inscription and description (Akrich, 1991) becomes important and, generalized, could be understood as a call for not ignoring the reader of the text: In this she opens-up Woolgar's argument where the writer (designer) limits possible readings (uses and interpretations) of the text (machine) through its composition:

> "For some time sociologists of technology have argued that when technologists define the characteristics of their objects, they necessarily make hypotheses about the entities that make up the world into which the object is to be inserted" (Ibid., 207f).

Inscription (of possible readings of the machine through black-boxing these assumptions and interpretations) is contrasted with a process of *description*. Here Akrich attacks Woolgar, by pointing out that the suggested designer-user-technology-interplay through inscription becomes more problematic when encountering the multiplicity of potential users and their seeming "misreading" of machines: "Thus the method of content analysis, as applied to texts, adopts an individual and psychological approach that has little or no relevance to our problem. Indeed, because it ignores the wide range of uses to which objects may be put, it comes close to technological determinism" (Ibid., 208). Herself using terms operating within the metaphor of

texts (inscription, description, content analysis of machines as texts), she points to the issue of Woolgar's concept that we started off with – putting forward a quite strong critique: "[…] [I]f we are interested in technical objects and not in a chimera, we cannot be satisfied methodologically with the designer's or user's point of view alone" (Ibid.). Akrich suggests going beyond Woolgar. The analysis of technical objects needs a constant going back-and-forth between the user, the designers, the objects and the designer's projected users, "between *the world inscribed in the object* and *the world described by its displacement*" (Ibid., 209). In this, Akrich opposes the *inscription* (where she largely still follows Woolgar's argument) with the term *description*:

> "The notion of *de-scription* proposed here has to be developed within this framework. It is the inventory and analysis of the mechanisms that allow the relation between a form and a meaning constituted and constitutive of the technical object to come into being. These mechanisms of adjustment (or failure to adjust) between the user, as imagined by the designer, and the real user become particularly clear when they work by exclusion, whether or not this exclusion is deliberate" (Ibid.)

It is this entangled view of the users and technologies that also gets applied to this study, although in restricted ways due to the investigated case: I put forward a understanding of users that emerges from a cultural-semiotics perspective, where the user is itself embedded in specific social fabrics and re-specifies and re-interprets the technologies he/she is using: thus de-scribing it, reinterpreting it and indeed making it something new and potentially different to what the designer imagines. Yet, this perspective is limited in its application to the case, as one only witnesses how CAST imagines the use and application of AAL-technologies. I am dealing mostly with inscriptions of users, rather then users de-scribing AAL in its application (or how those watching the videos as an technology potentially de-scribe the futures, for that matter). Yet, it is important to acknowledge the central position of Akrich's user-conception in this study, as indeed I do not want to suggest that what CAST imagines AAL to be is its ultimate and final essence: Rather re-interpretations and de-scriptions are to be expected, yet not covered in this study.

Finally, who is "the user" in this study: There are two of them: The users of AAL-technologies as they get imagined in the videos, and the audience of the videos themselves. The latter cannot be brought into perspective here, although they are most certainly important. Yet, more relevant for this study and the questions I am addressing is the first category of users: those of AAL-technologies. And here, again, I take the perspective of Akrich that suggests a strong entanglement of designer, technologies and users. In my analysis I am focusing on the inscriptions of imaginations of users, as described by both, Woolgar and Akrich. Yet, I neglect the power of these inscriptions, as suggested by Woolgar, acknowledging the possibility of de-scription and non-compliance with the inscribed imagination of the user. I accordingly will discuss in chapter 10 some aspects that emerge when considering the possibility of deviations from the normal-user inscribed by CAST.

1.2| Conceptualizing Technologies

What emerges when applying such a user-conception to this study, has been pointed at on several occasions: Rejecting the linear model of technological innovation and taking up a constructivist understanding of bringing together users, technologies and designers in compiling a better understanding of technologies, makes Ambient Assisted Living appear as what Latour and others (in the most impressive ways on the example of Paris – Latour et al, 1998) coined socio-technical assemblage.

What should have become clear by now, is, that AAL – as any technology – is not made up by its mere material components of sensors, wires and processors: It emerges from the interconnectedness of its designers, their projected users, the "real" users, and their inscriptions and de-scriptions just as much as it is constituted in the mere technological components. Putting forward this notion of socio-technical assemblages (which is what emerges from associating these parts) Ambient Assisted Living appears more complex – with far-reaching consequences for what this study is.

Remember the initial question we started-off with: How are social orders and knowledge/technological orders co-produced in making the future of AAL?

When looking at the videos published by CAST, they can quickly be understood in the terms proposed by Akrich and others, as outlined above: As processes of imagining the relations between users, designers and technologies – and only in doing so does the term Ambient Assisted Living gain its *situational* meaning. Through their representation they get associated with meanings, situated in distinct social realms, incorporating specific norms, values, wishes and ideals; all of them shaped and explicated in their visual representation within the video.

Following these issues becomes one central task for this study, where asking for the inscription of users- and technology-projections (inscriptions) is one important objective – and thus what the configurations of users and technologies entail normatively.

In this, what has been initially described as making sense of Ambient Assisted Living gets clearer: AAL must be understood as a socio-technical hybrid of users and technologies – a hybrid that is made and visualized in the videos. We can understand the videos in this sense as one site for establishing a specific socio-technical hybrid-version (or: vision) of Ambient Assisted Living. The videos then appear as a means of representation of this hybrid in making its future. In this regard it is important to rely on a double-construction in order to account for the videos as a technology on their own: A technology for representation. Here it is also important to provide an understanding of the means and aims of these representations – something that has been extensively elaborated in the very beginning of this study on futures and future-promises. As the co-construction of technologies and users is placed in visual representations produced in videos, depicting a future-vision, it is important for this study to situate them accordingly and understand them within this future-narrative.

I thus put forward an understanding of "technology" that is strongly tied to what Woolgar and – in extending his work – Akrich have to say on the behalf of "the user": namely a deeply cultural understanding. Technology in the understanding I am pushing forward, is not the product of one genius' inspirational invention, but is the product of social processes, embedded in cultural and knowledge traditions and impacted by interpretations of social orders: What is it imagined to provide? Where should it be implemented? The imaginations of the users matters just as much as the interpretations of the social fabrics the technology is ought to be implemented in and from which it departs. In such a perspective technologies also don't appear as the innocent artifacts they usually get described as, particularly in a linear model of science and technology. As particularly Latour suggests, most noteworthy in his monograph "We have never been modern" (1993), technology is at once a socio-technical assemblage (cp. Ibid., chapter 1, p 1 - 13), and on the other hand it has the capacity of disciplining and adjusting power, acting on its own "back" on society becoming an "actant". In this conception, the differentiation of humans and nonhumans does appear not to make much sense. I will elaborate this further in the next sub-chapter on ANT. Following from these arguments I want to understand technologies as having politics (cp. Winner 1980): Not only through them being the product of social and cultural orders, but also by incorporating and materializing them, enacting them through their black-boxing (cp. Latour, 1993).

This is vital for the perspective this study takes on technologies: As user-conceptions get inscribed in technologies, they materialize and incorporate - and finally black-box – them. It is thus important to ask for CAST's interpretations of social orders and how they translate (cp. Callon, 1986) and builds them into their take on Ambient Assisted Living-technologies. Such a perspective then allows not only to "see" how social orders get materialized in technological manifestations, but also how they are extended through them and achieves their consolidation: black-boxed social orders then gain additional disciplining and ordering power, as they get incorporated in technologies, making them harder to be negotiated. Broken down to this case, black-boxed imaginations of late life and care, for example, then gain additional power and it becomes central to understand how their technological materialization supports their dominating power.

2| Theoretical Frameworks guiding my Analysis

This is the aim of this study: Seeking to understand *the making* of the socio-technical hybrid called Ambient Assisted Living in its representation through the video. The videos then are a technology of arranging social and knowledge orders and inscribing them in the representations. Making oneself aware of the videos being themselves technologies, the second crucial dimension of this study comes into focus: That of the co-production of social and knowledge/technological orders (bringing into vision the "designer-side" of the user-technology-designer-triple).

2.1| Actor-Network Theory

Actor Network Theory is focused on the analysis of emerging networks and it simultaneously tries to annihilate the divergence between nature and society (e.g. Callon 1986, Latour 1987; Johnson 1988). What ANT makes visible by introducing non-humans as actors is the agency of technologies. It raises particularly critical questions: What circumstances define the way we interact with certain devices and non-human actors? How do these circumstances come into being? Who (human and non-human) is being involved in this process?

Callon (1986) outlines the process of translation in establishing research agendas and producing knowledge and technologies. He describes the dynamics involved in formulating and framing problems and convincing other actors of this problematization. In this respect OPP serve for positioning solutions in specific framings associated to this problematization. Via problematization and the establishment of the technological fix as the solution, different actors are aligned accordingly to accept and incorporate this problem-fix-construction in their identity's interdefinition. This approach is crucial in understanding the emergence of new networks, as well as its inscriptions. ANT's analysis of emerging networks offers an intriguing approach for the analysis of CAST's orchestration of its futures. Here the sociology of translation offers a tool to understand the dynamics at play for telling the future in terms of a problematization-fix-narrative.

Additionally inspiration to this study comes from Latour's "Science in Action" (1987) and "We have never been modern" (1993. As for the former, primarily Latours work on inscriptions is important. As developers imagine how and by whom they are going to be used, these imagined identities are inscribed in the technologies black boxes (Latour 1987, 1-20) and thus enfold disciplining and discriminating effects on their users.

2.2| Co-Production

> "Briefly stated, co-production is shorthand for the proposition that the ways in which we know and represent the world (both nature and society) are inseparable from the ways in which we choose to live in it. Knowledge and its material embodiments are at once products of social work and constitutive of forms of social life; society cannot function without knowledge any more than knowledge can exist without appropriate social supports. Scientific knowledge, in particular, is not a transcendent mirror of reality. It both embeds and is embedded in social practices, identities, norms, conventions, discourses, instruments and institutions – in short, in all the building blocks of what we term the *social*. The same can be said even more forcefully of technology" (Jasanoff, 2004, 2f).

The first important aspect covered in this quote is to be found in the very last sentence of this quote: While Jasanoff is talking mainly about (scientific) knowledge, her outlines are even more so valid for technologies. Yet, the disambiguation is important, and this is accounted for in the research question by the dichotomy of knowledge/technology orders. One can build this argument by relying on what has been outlined so far in this chapter, in particular with regards to the aspect of inscription, as this can be understood as a process of materializing knowledge orders: Technologies incorporate and materialize knowledge. On the example of Ambient

Assisted Living, (culturally constructed) knowledge about what e.g. aging entails, interpretations of social worlds or medical knowledge get inscribed and materialized in the technological devices. When I speak thus about knowledge and technological orders I talk about two strongly related issues, where the one gets incorporated, transformed and stabilized in the other (which particularly Akrich elaborates). One thus cannot equate them, as the materialization of knowledge is also always a transformative process where knowledge orders become manifest in devices, but potentially also transform this knowledge: For example the translation of medical concepts into threshold values that get measured entails the translation of knowledge into measurement constituting actions, but also eradicating the knowledge assumptions that constituted the definition of the thresholds in the first place. In this, it is important for this study to understand how and what knowledge orders are built into ("black boxed") AAL technologies and how they are transformed in this process. Related to this, I also have to ask for the knowledge orders CAST relies on and mobilizes when imagining the future of AAL. And a third aspect I carve out in this study is the potential consequences these orders have for "the social" realms they get applied in through their technological materializations.

This is what the concept of co-production allows me to do: social and knowledge orders cannot be thought of as existing separately and, on the other hand, knowledge orders are constitutive for social live (and vice-versa, as explicated in Jasanoff's quote). In this, I am particularly interested in how the social worlds and their interpretations inform the knowledge CAST inscribes in their future vision of AAL (and thus into their imaginations of the technology and how the work in and with social realms). Particularly interpretations of the health care sector in the US, the needs and preferences of the elderly and their relatives, and associated problems will inform the construction of the techno-futures promoted by cast, but also their expectations towards those watching their corporate videos. The medical knowledge and the social orders get co-produced in the making of the futures of AAL and understanding these processes is the aim of this study. For doing so it must shed light on how technological orders and social orders get interconnected in the future-visions themselves, as well as what knowledge orders are drawn upon and inscribed in these visions – this is in focus of the next, second, section of this thesis. In the third section I am going to then turn to the co-production of the videos as technological ordering devices and the social actor of cast with its institutional identity and the interpretations of its social environment.

Chapter 5: Methods

INVESTIGATING FUTURES: VIDEO ANALYSIS FOR STS

> "Pick up almost any of the existing textbooks dealing with 'visual research' and it is a safe bet that the discussion will focus in some way on the use of photographic images. [...] a second branch, one with closer affinities to the continental schools of semiotics and cultural studies, favors the investigation of commercially produced images and an analysis of their implicit ideological and cultural messages" (Emmison, 2006, 246).

> "Images may transcend cultural lines in ways that words cannot, thereby helping to create communities of meaning and shared responses or demands that cut across ordinary linguistic and governmental divides. More generally, there is growing interest in the social sciences in the power of visual representation to sway both belief and action (Scott 1998). Sight moreover, like any sense, is now seen as something that has to be manipulated and disciplined in order for people in the aggregate to see things in the same ways. The politics involved in constructing common vision has accordingly begun to draw attention (Jasanoff, 2001, 3).

We are confronted with innumerable videos in our everyday lives, as we encounter them in advertising, as (short-)films, image-films and "clips", on the streets, in TV and cinemas or on YouTube. We share them via our social media, watch them together as a shared experience on computer screens and discuss them at length ("have you seen the latest video of x about z?"). Videos, especially in social media, become increasingly an integrated part of our social lives – not at least through their accelerated distribution through channels such as YouTube, via Twitter or on Facebook. Despite this, scholars in the social sciences seem still reluctant on whether and how to integrate videos into their research, let alone how. Even visual sociology - only recently again gaining popularity - remains far more potent in analyzing images than it is the case for analyzing videos.

In this chapter I am going to detail my methodological approach applied to this case study. Particularly I will discuss the specifics of my approach to video analysis, building strongly on semiotics and content analysis. I am also going to detail conceptualizations of videos as technology, as this is particularly important due to the large gap in methodological reflections and remarks towards video analysis as self-standing methodological approach.

*The **first sub-chapter** will provide a discussion of video analysis as it is applied in STS and more generally in the social sciences. As the method remains surprisingly underdeveloped, I am going to provide some reflections upon the character of videos as material (**1.1**) and as ordering devices, where the camera must be taken into account for analysis (**1.2**). **Sub-Chapter 2** will give an overview of the materials brought to analysis, whereas the final **third sub-chapter** will discuss the research design of this study, presenting the here-applied approach of Semiotics and Inductive Qualitative Content Analysis following Grounded Theory.*

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1| A Short Overview of Video Analysis in STS

A vast majority of studies coming from this field, although potentially insightful for studies of science and technology, deal with either images or research-provoked videos (compare Silverman, 2006, 240ff). This then becomes also tangible in textbooks on social science methods, even when dealing explicitly with "the visual": "Pick up almost any of the existing textbooks dealing with 'visual research' and it is safe to bet that the discussion will focus in some way on the use of photographic images" (Emmison, 2006, 246). This still dominating reluctance to include the visual more broadly, also including videos, ("[…] [Even ethnographers who gather observational data have sometimes been curiously reluctant to use their eyes as well as their ears"; Silverman, 2006, 241)) may be due to what I want to call a reception-production-problem: "[…] [I]t is sometimes argued that an attention to the image alone can detract attention form the social processes involved in image production and image reception" (Silverman 2006, 241).

Only recently, then, more wide-ranging research focusing on analyzing videos was carried out and even became more fashioned within the social sciences (despite "older" works, like Bateson and Mead, 1942, Goffman, 1979, more recently works are still hard to come by, with outstanding works by Hall et al., 2006; Harper, 1988; Knoblauch et al., 2006; Prosser and Schratz, 1998; Suchman and Trigg, 1991) – only making the general lack of settled methodological consent even more visible and problematic. What accounts for social sciences in general, is particularly true for research affiliated to the studies of science and technology. This is surprising, when facing the vast impact of works by Kirby (2009) or Jasanoff (2004) stressing the importance to account for visual representations of science and to open them up to a more careful reflection in an S-T-S-perspective. How to analyze videos from a social science perspective thus still remains widely un-addressed; and quite often research using video-analysis as a key method turns out to apply a more or less well adjusted set of methods as "immediate" and "fast" fix for an otherwise methodological problem yet to be addressed more carefully.

One noteworthy deviation from the rule is media content analysis (Macnamara, 2005) with its "[…] four main approaches to and roles of content analysis: Descriptive; Inferential; Psychometric; and Predictive […]" (Ibid., 3f). Regardless, the dependency of content analysis on the "translation" from the visual to the textual (Ibid., Reichertz & Englert, 2011, 21ff) can be seen, especially in light of works such as Jasanoff (2004a), as highly problematic. Critique on both, quantitative and qualitative approaches of content analysis in this respect can be found e.g. at Macnamara (2005, 4f). Newbold et al.'s critique on the quantitative approaches (quoted from Ibid., 5) stresses that "quantitative content analysis 'has not been able to capture the context within which a media text becomes meaningful'". The textual approach of content analysis, quantitative as well as qualitative, is perceived as largely unproblematic, as also Reichertz & Englert argue for their hybrid approach of content analysis and hermeneutics. Still, based on the critique quoted above, I perceive this translation of visual to textual as a key problem in this

approach of analysis – and it still remains an object of heated discussions. Nevertheless, content analysis may be seen as the most elaborate approach within media analysis – and thus the most sophisticated one. Yet, especially with qualitative media content analysis, McKee (2004; quoted from Macnamara 2005, 15) "notes that 'we have a very odd lacuna at the heart of cultural studies of the media. Textual analysis is the central methodology, and yet we do not have a straightforward published guide as to what it is and how we do it".

1.1| Three Types of Video-Materials for Analysis

When it comes to the analysis of videos, a large majority of studies focuses on two general types of materials: either "research-provoked" or "naturally occurring" videos. The former are materials that are produced or provoked by researchers themselves, as it is the case for Videography. The phrase "naturally occurring" videos points to materials that are part of the empirical field and depart from it – as it is the case of videos as memorabilia. Whilst using such videos as empirical material is well grounded in its methodological approach, the analysis of what may be (for lack of a better term) called "produced videos" remains still widely unacknowledged as a self-standing method in STS and generally in the social sciences (see also, e.g. Silverman, 2006a & 2006b, or Flick, 2009). With "produced videos" I refer to such videos that are retrieved from the field of inquiry, being produced by one or more actors in a more or less professional manner (thus pointing to the notion of *production* as a phase in film-making). "Produced videos" are thus not produced by "lays" [15] using their camcorder to create artifacts with the main-purpose of "memorabilia". Rather, the term "produced videos" encompasses advertisings, movies, corporate or image films, and similar materials that are made in professionalized settings.

"Produced videos" could be films and movies, corporate films or promotional videos and (mostly) rely on professional filming infrastructures, involving (usually) more then one person and (usually) are scripted. "Naturally occurring videos" on the other hand are produced in un- or semi-professionally manner (in the sense of professionalized infrastructures) by one or two actor(s). This differentiation remains rough: The borders are fluid and not fixed. Also, techniques may vary, where produced videos simulate lay's filming techniques and visual style – and where lay's videos production quality reaches that of professionally produced videos.

The disambiguation of "provoked", "natural" and "produced" does not imply that the one is more "pure" in depicting social realities than the others are. Rather it refers to the modes of production. The main difference between them is thus the production-efforts and the attached meaning: Produced videos are mainly characterized by their detailed planning-character, where every shot, everything that gets shown and communicated, is planned ahead. Accordingly, the attached meaning is different: When watching them, one consumes e.g. movies, advertising videos, or the news on TV differently, and treats them differently then it is the case for e.g.

[15] Of course the term „lay" is critical, as it could suggest a lack of knowledge or expertise. As STS argued strongly, lays-knowledge is also a form of expertise; Further, also „lays" can show highly professional methods in making films, as becomes particularly visible in many YouTube channels with a wide outreach and thousands of regular followers.

wedding-videos. We watch films in cinemas, advertisements on TV, wedding videos at home with friends. Just as we may watch movies for joy, trying to ignore the advertisements interrupting the program, and enjoying the shared experience of watching recorded milestones of our lives.

Reichertz & Englert (2011) suggest a similar frame of differentiation, the "camera". Both mean the same thing: a complex system-network of actors involved in producing and structuring the video at stake. The "author" or "camera" does refer to a network of actors and implies also conditions and techniques of filming and producing. Videos are to be understood as a socio-technical assemblage. This disambiguation reveals the difference between analyzing professionally produced videos and those that are "naturally" occurring" or "provoked" by researchers (as for example in videography; Pink 2001).

Whereas professionally produced films and videos use (almost) always pre-defined and scripted camera-shots, "naturally" occurring videos usually don't. This does not imply that what is shown is not also a selection of "reality", but rather points towards a less professionalized approach of selection – with implications for the modes of analysis: Whilst in "naturally occurring videos" a fundamental part of what is observed by the camera is unscripted, in professionally produced videos nothing is coincidentally shown: Even if something coincidentally filmed ends up to be included in the final product (the video) it is then included as reflexive choice. As Reichertz & Englert suggest: Already " […] the focus of the camera implies decisions of what is worth to be seen and what is not. Filming is thus a different practice than videography und must be accordingly reflected in the analytical approach" (translated, refer to original for comparison). It has to be amended that also in videos produced by lays everything has meaning. But it has meaning in different ways: The shown represents an ultimately different ordering-technique.

1.2| Videos as Ordering Device

Videos are not "empty" (as without attached and coordinated meaning) shells, but selective perspectives. Just like images, videos also depict constructed realities: What gets shown, in which ways and to what extent – both, in audio and video – are deliberate and sub-conscious choices. Reichertz & Englert (2011, 11f) stress this tension between author and material, as they explain: "There is no such thing as an 'innocent' (camera-)image. And there are no innocent videos, as well. We are thus interested in the societal massage of certain videos, what it (or more precisely: its collective author) wants. […] The 'camera' should be understood as social system of actors trying to influence the consumer/audience with certain social practices of visual representation" (translated; refer to original for comparison). It is important to reflect on videos as being staged and scripted in strategic ways. Analyzing videos demands including the analysis of the circumstances of their production. Who produced the given video, how, with which means and to what ends? Who is the intended audience and how is it imagined to assess the videos? Although the author's intent for producing the videos influences the video's structure, it does not guarantee the message to be understood accordingly by the recipients.

When analyzing videos, their meanings cannot be taken for granted. Rather, videos must be understood as the procedural product produced by a complex social system of actors. The communicated meaning of videos depends strongly on a) what its author intends it to mean and b) how the audience interprets its meaning. Where the video is published, under which circumstances and in which ways (e.g. on a company's website, on YouTube, in the news, etc.) strongly influences the video's make-up and how its message is communicated. A video-clip as part of the news on TV will be differently organized, structured and narrated than a YouTube clip or a corporate-video on a company's website, as its message, its reception and its means (as indented by the author) will alter. Thus situating the videos must be part of any video analysis.

It becomes clear, that this study is not one of videos *per se*. Rather it is a study of the camera as a socio-technical assemblage. When asking for the co-production of the technical and the social in future-making of Ambient Assisted Living, I then provoke the analysis of a double-assemblage: Ambient Assisted Living become a techno-social hybrid, an assemblage in its own right. Materialized in videos, as a not yet existing assemblage that only exists in the future construed in the video, it then is virtual and real simultaneously, following Kirby's (2009) understanding of *diegetic prototypes*. The realm of the visual becomes then a procedural product of another assemblage, the camera. Understanding the one is then only possible by analyzing the other - and both must be in the focus of this study.

This then implies a number of consequences.

1.) The camera must– also given the initial research question – be as much a part of the focus of analysis, as it is the case for what it actually shows: At least two parties are communicating in movies: those in *front of* and *behind* the camera (Ibid.). This implies focusing on how the camera moves, its visibility, the chosen *frames* and the ways they establish a narration through *montage*.

2.) This implies the agency of the camera. What is shown is not reality, especially – and more obviously so – in the case of professionally produced videos. The camera "creates, constructs, composes a single, two-dimensional visual-audio-sphere, where the audio may go beyond the scope of the visual" (Ibid.[16]). This established view (framing) establishes borders, through which specific relations of actors and artifacts are being established. This again highlights the importance of including the camera as agency into analysis and further calls for a different unit of analysis then the *still* -as through montage relations get established, which gain their meaning through the on-going flux of the videos.

3.) It is thus also important to reflect during analysis not only what gets shown, and how it is shown, but also what is left out, hidden away and remains not shown (Ibid., 27).

[16] Translated. German original: „[…] sie schafft, sie konstruiert, sie komponiert einen eigenen, zweidimensionalen Bild- und Tonraum, wobei der Tonraum größer, weiter sein kann als der Bildraum."

2| CAST's "Produced Videos": Situating the Materials

LeadingAge is an association of over 6.000 non-profit organizations (NPO), initially founded in 1961 and based in the US. It operates within three areas: policy-making, research (and its support) and promotion of practices and members. The 6.000 member-NPOs cover the entire field of aging services, including 38 state partners, businesses, consumer groups, foundations and research partners. *LeadingAge* was initially funded to foster exchange and secure a stronger stand in policy-making around aging and wellbeing, or – as put forward on *LeadingAge's* website – it is committed "to advancing leadership in aging through innovation".

The *LeadingAge Center for Aging Services Technologies (CAST)*, a sub-unit of *LeadingAge* focused on technological innovation, has published the videos being analyzed in this study. CAST, as one of three "centers", is specifically focused on the technology-branch of *LeadingAge*. It thus is focused on *LeadingAge's* aims associated with the development, assessment and diffusion of technologies for eldercare-purposes, or –as it is being coined on CAST's website – "that can improve the aging experience"[17]. For this purpose the analyzed videos were published on the CAST-website, distributed via YouTube and shown at conferences.

Although being central, the videos alone do not make up the case this study is focused on: The institutional framing of the case is important to be considered for analysis. *LeadingAge*'s self-representation on the website, where the videos were published, will be the main source for describing this institutional context of the videos. As the videos are mainly accessible through the website of LeadingAge/CAST, their self-representations on this site provides framing of the videos. It is this self-conception that is expected to structure the make-up of the videos and the future(s) made in them. Further, it is important to understand the American care-system, as the videos are being published in this context. A detailed analysis of LeadingAge and CAST as institution, situated within the wider-frame the U.S. health care system is provided in the first chapter of section II of this study.

2.1| The Videos

In 2005 the "LeadingAge Center for Aging Services Technologies" ("CAST"), an "international coalition of more than 400 technology companies, aging services organizations, research universities, and government representatives"[18, 19], published promotional videos on Ambient Assisted Living technologies. These videos "chronicled an older gentleman's technology-enhanced care"[20] and showed a variety of technologies that were in development in 2005 (but did not arrive on the marked, yet). This first "corpus" of videos represents the variation of one image-film, called "Imagine – The Future of Aging", using the same basic video material, but structured it in

[17] http://www.leadingage.org/CAST.aspx
[18] all links quoted in this paper retrieved on March 21, 2014
[19] http://www.leadingage.org/SubSection.aspx?id=525
[20] http://www.leadingage.org/high-tech/

different ways (different subsequent order of scenes, length of single scenes, etc.), as they address different audiences. In 2005 CAST published three versions of the video (with another, fourth, version only including one variation):

1. The initial 8m-35s long image-video "Imagine – The Future of Aging" centering on a family "telling their story".
2. A shorter version (3m-16s) of the same video highlighting specific key-arguments/-aspects of the first version.
3. A 2m-27s long variation of (1) and (2), where mainly the same video materials are shown, but with different length of singe scenes, presenting more a "expert-centered" view (where experts and technology developers are the main characters) instead of the initial "family-centered" version(s).
4. Additionally, in 2007, the same video as in (1.) was re-published, including an additional introductory talk by actor Jeff Bridges explaining to the audience the "necessity of providing good care" with the aid of technologies.

Accompanying these videos, a bulk of materials has been published on *LeadingAge*'s website, most important the "introductory video discussion guide, designed specifically for aging service providers, describe[ing] the technologies shown in the video and offer[ing] suggestions of ways to use this powerful media tool"[21]. Further, the sub-page[22] with the initial 2005-video-corpus offers also descriptions, framing the videos for the visitor of the website.

On December 19, 2012 (and updated on April 3, 2013) a new corpus of video-materials was published by CAST as "a follow-up to 'Imagine – The Future of Aging" […]", explaining that the 2005' s"[…] video [corpora] included computer-generated technologies that were not available for purchase. All of the videos in High-Tech Aging [Note: the new video(s) from 2012] are currently on the market, though infrequently used together"[23]. This new video – available in a two-minutes and in a 12-minutes version – was published on the website and the YouTube channel of *LeadingAge*/CAST, titled "High-Tech Aging: Improving Lives Today". Just as the 2005-videos, also for the 2012-video a number of accompanying materials were released on CAST's website. A 12-part series, called "Alma's Technology", examines the aging services technologies highlighted in the video, although only 11 of the 12 parts were published (as on February 09, 2015). With them being published monthly until Nov 2013 the final part of the series cannot be included in the analysis and even a later publication seems unlikely.

[21] http://www.leadingage.org/Imagine-the-Future-of-Aging.aspx
[22] http://www.leadingage.org/Imagine-the-Future-of-Aging.aspx
[23] http://www.leadingage.org/high-tech/

Thus, for this case study a rich selection of materials can be provided for in-depth analysis:

- **3 videos** of the initial 2005 "Imagine: The future of aging" – corpus (the fourth being excluded due to its minor variation of the initial full-length video)
- **2 videos** of the subsequent 2012 "High-Tech Aging" – corpus
- The **user-guide** on the 2005-video-corpus
- The **11-part-series** on the 2012-video corpus (as the 12th part was not published, it will be further revered to as 11-part-series)
- The **framing introductory text materials** published on the two sub-pages[24] of the CAST-website, where the respective videos are presented to the audience
- Materials form the website for framing the case and the publishing institutions as part of it.

2.2| Administration of the Materials

For analysis, the materials are used as they were retrieved from the respective website(s) on March 31, 2014. The materials were retrieved in three ways: (1) as purely textual versions by copy-pasting the website's contents to word-documents for further analysis; (2) as a off-line accessible saved original-versions of the relevant pages of *LeadingAge*'s website; and (3) as screen-shots of crucial sections of the website. Changes on the website, as the may have appeared after March 31, 2014, were not included in analysis. The videos, in the versions they are presented on the CAST-website and on YouTube, as of March 12, 2014, were downloaded and saved in MP4-format. Although taken into account in their entirety in a first analysis, the focus of the video-analysis rests on the full-length videos. Deviations in representations were deemed as playing a smaller role then expected in regard to this studies' purpose. These deviations potentially matter more in the actual use of the videos as political instruments, as they get presented to different audiences – yet this is not the focus of the research conducted and presented here.

3| Research Design: Analyzing CAST's "Produced Videos"

The general design of this study followed the videos from an over-all perception to a detailed, in-depth analysis of selected sequences. This approach from the broad to the narrow aimed at de-constructing the narrative of the videos to arrive at the contained conceptions that make-up the socio-technical hybrid of Ambient Assisted Living.

A *first* viewing of all the materials provided a more general understanding of their set-up and how they are interrelated. The initial comparison between the two corpora allowed a first situating. This first re-viewing remained general, with notes taken to document first thoughts and potentially important sections for analysis.

[24] *http://www.leadingage.org/high-tech/* and *http://www.leadingage.org/Imagine-the-Future-of-Aging.aspx*

In a *second step*, the single videos came into focus, again with a first general re-viewing, followed by a constant shift of zooming-in and zooming-out, where detailed analysis of chosen sequences were followed by stepping back to a general re-viewing of the videos to situated the gained insights. The analysis of the single videos applied this technique of repeatedly zooming-in & zooming-out while analyzing video-segments and audio-segments (textual & visual) separately first, before bringing them back together. Qualitative content analysis and semiotics were used as the main methodological approaches. In a *third step,* the accompanying documents were selectively analyzed, using content analysis for more detailed review of selected sequences to gain insights in the (self-)conception of the publishing entity.

3.1| The Camera Made Visible

It has been argued for the need for bringing the camera into analytical perspective. Partially this is reflected through addressing CAST as the "author" of its futures and situating the organization within the social fabric it acts in (the US eldercare system). This is further reflected in the analytical perspective applied throughout the study: The difference between analyzing videos with their content as taken for granted or shifting the focus to the camera as device of selection, framing and montage, impacts the outcomes of a study. The advantage of applying the latter perspective is that videos can be understood as strategic devices assembling their contents through deliberate selection – adding an additional dimension of meaning-production. In the analysis this was reflected by asking not only for *what* gets shown, but also for *how* something is shown (or not shown) and interrelated to other elements within the video and beyond.

3.2| The Videos Made Tangible

For the analysis of the videos a procedural process was applied, with a focus on content analysis and semiotics. This aimed at developing and applying a specific hermeneutical approach, attuned for the analysis of video-materials and also reflecting the preliminary outlines above. Deriving from the general research design, the methodological approach for analyzing the videos can be conceptualized in three main steps, with reflection-loops after each: After transcription and a first general analysis (**step 1**), via content and semiotic analysis, an in-depth analysis of textual/audio and visual elements of chosen sequences resulted in a first preliminary conclusion on the guiding research questions. Particularly a first (inductive) demarcation of guiding concepts of aging/late life, AAL-technologies, and care was achieved and fed back into a more narrow segmental analysis. The initial findings informed this **second step** of analysis that also aimed at a) re-producing and sharpening the inductively generated categories and b) understanding their mutual interrelations and reciprocal definition and framing. In a **third step** the two so far separately re-viewed levels (textual/audio – visual) were brought together. The mechanisms of reciprocal production of meaning through text and videos as a whole were the focus here. This allowed not only for the re-specification of the preliminarily findings, but – primarily – also allowed for the re-tracing the contingency of producing meanings through the entirety of the

video. This analysis (both, focusing on single segments and their collective meaning) allowed for the ability to carve out the rhetorical strategy of the videos, providing a more holistic understanding of videos as sites of co-production.

3.3| Content Analysis & Semiotics

Qualitative Content Analysis and Semiotics – these are the two methodological tools applied in this study. This is connected to the research questions posed in the beginning, as both of them fulfill specific aims: Identifying underlying concepts through inductive means (meaning that it is the aim to arrive at definitions of concepts along the materials and not a priori) is one of them; and qualitative content analysis provides the adequate means for doing so. Furthermore, it allows us to relate them to each other, as content analysis suggests that definitions can derive from context-meanings of other categories (which – at a large – represent the categories). This then allows an understanding as to how the different concepts are tied together and mutually constitute or re-define their meanings. Semiotics, on the other hand, allows the ability to analyze visual materials on their own, as they aim at arriving at a genealogy of *signified* and *signifier*. How the visual layer of the video transports, establishes and carries meaning on its own, becomes then analytically tangible. Through this means and the described procedural design of application, the means for arriving at a genealogy of conceptions is provided, allowing further analysis based on this collection of materials. Content analysis of the accompanying materials further allows for situating the videos.

3.3.1| Dissecting Videos: Units Of Meaning In A Fluid Media

Being the two main methodological approaches, content analysis and semiotics seem perfectly suited to be applied to the analysis of videos. Nevertheless, some adaptions for their application to *moves* (i.e. the fluidity of images in film and video) instead of *stills* (i.e. single images, such as paintings or photographs) are obligatory.

The potentially most important difference between *move* and *still* is the coherence of the latter in the first, which has to be reflected in the make-up of the research design, especially when applying content analysis. As videos are more than the sum of their elements, only bringing together the visual and the audio can provide a full understanding of videos. Single-shot analysis (analyzing the single images on their own) will not provide a fruitful analysis. It is necessary to define *Sinneinheiten* (units of meaning) - differently to e.g. Iconography, which focuses on the narrative path contained in single images (compare Reichertz & Englert 2011, 23 & 30f). Following a holistic first analysis of the entire video, "**points of turn**" are considered an adequate starting-point for dissecting videos. "Points of turn" are sections of the respective video, where its story is further developed. This can be turning points within the plot in the story or newly emerging relations between actors within the video. These "points of turn" can be understood as signs that allow identifying important passages of the videos that then can be

brought to more in-depth analysis. Important are not only these points of turn on their own, but also the following segments of the videos where the consequences of these turns become explicated. This does not necessarily follow a scenic logic (where single scenes are brought to analysis) but rather follows the narrative structure of the video.

3.3.2| Qualitative Content Analysis

Qualitative content analysis offers many advantages, especially in respect to the research question demanding inductive definitions of categories and their interrelations in order to provide a better understanding of contained conceptions such as aging, well-being, health, etc. Given this interest, qualitative content analysis seems adequately equipped to fulfill this task. Yet it relies on textual materials that are brought to analysis – constituting some crucial limitations of this method. Different to quantitative content analysis, the qualitative approach provides the means for arriving inductively at the categorization. It further allows retrieving important categories, their definition and their interrelations (i.e. mutual constitution meaning) directly from the materials (and not through a-priory definitions), which again better suits the interest of this study. Mayring (2000) as well as Macnamara (2005) outlined this advantage of qualitative content analysis. As the latter (p. 3ff) outlines, content analysis of media massages is especially suited:

- To describe substance characteristics of message content;
- To describe form characteristics of message content;
- To make inferences to producers of content;
- To make inferences to audiences of content;
- To predict the effects of content on audiences. (List quoted from Ibid., 3)

and thus is especially suited to "explore the meanings underlying physical messages […], grounding the examination of topics and themes, as well as the inferences drawn from them, in the data […]" (Zhang & Wildemuth 2009, 1) allowing to "produce descriptions or typologies, along with expressions from subjects reflecting how they view the social world" (Ibid., 2). "By this means, the perspectives of the producers of the text can be better understood by the investigator as well as the readers of the study's results" (Ibid.). This then is exactly the advantage of bringing the camera into perspective, one of the key-aims of this study.

The problem here is the restriction to (textual) massages and thus the general understanding of videos from the point of view of symbolic interactionism. This perspective suggests that media messages can be transferred easily to text and thus made accessible for further analysis. This may be true for audio-data, but becomes - in respect to the general remarks on video analysis – problematic when dealing with visual data. Additional methods are required to fill this gap – semiotics is considered an adequate addition (compare Ibid., 15) and will be outlined in the following.

The approach of qualitative content analysis follows the suggestions of Macnamara (2005, 14ff), Zhang & Wildemuth (2009) and Mayring (2000). Two means are central, along with Mayring (2000), when applying qualitative content analysis: inductive category development and the categories' deductive application. This implies that inductively developed categories must be re-applied in a second step for re-specification: During inductive analysis categories and their definitions are retrieved from the transcripts. This genealogy of categories then was applied deductively on both the initial transcript of video and another transcript from video b in order to test their reliability. The application to another video further allowed identifying deviations, suggesting the need for further analysis to explain these deviations. Although Mayring suggests a priori definitions of categories to provide a more systematic approach, this is considered contradictory to this research design. Rather re-application of inductively defined categories ensures the systematic component of qualitative content analysis. This is largely oriented on "intercoder reliability", where clear-cut definitions of coding schemes are required. Intercoder reliability also suggests using more than one coder. This is a problem for this study, as this cannot be provided. The procedure of conducting the inductive qualitative content analysis follows by and large Zahg & Wildemuth's (2009, 2f) suggestions.

- **Preparation of the data**: See transcription.
- **Definition of the Unit of Analysis**: See unit of analysis.
- **Coding and Categorization Schemes**: An inductive coding and categorization strategy was pursued, using the constant comparative method (Glaser & Strauss 2009) as guiding technique. This provided qualified indicative reasoning with simultaneously allowing to bring mutual constitution of meaning between categories into perspective.
- **Assess your Coding Consistency**: This is a loop-back where the stability and consistence of the coding, as applied, still holds or needs re-specification.
- **Draw conclusions from the Coded Data**: Based on the coding themes and categories are identified. This is by a large the process of analyzing the concepts immanent in the text in respect to the co-productionist perspective. At this point, also, relationships between the categories came into focus, finally arriving at a conception of Ambient Assisted Living as a techno-social hybrid.

This approach was used for the analysis of selected textual elements of the videos. Segments of these materials were analyzed with content analysis. Following from the previous outlines, content analysis can be understood as a valuable tool - especially in respect to the initial research questions on how conceptions of technological and social order can be understood in terms of co-production. The ability of content analysis to carve out categories and their inference seemed suitable to answer this question at least for the textual layer of the videos.

3.3.3| Semiotics

Semiotics "exposes [!] the ideological, latent meaning behind the surface of texts, allowing us to grasp the power relations within them" (Newbold et al. (2002, 249). This approach understands "words and **images** [emphasis added] [as] [...] signs that 'stand for' or 'signify' something else beyond their obvious manifest meaning" (Macnamara 2009, 16) and thus is – also due to its compatibility with content analysis – especially suitable as a methodological tool for analyzing visual materials without prior transcription into textual representations. Rather, textual representations and descriptions are the outcome of a first analytical process, where visual materials are analyzed along the relations of signifier-signified and argued based on the initial materials. The textual description and representation is thus only a second step and provides a more reflexive means of transferring visual to textual representations then it is the case for e.g. content analysis, as also Macnamara suggests: "[...] [E]lements of both de Saussure influenced semiology and Pierce influenced semiotics can be applied and each has something to offer for a comprehensive study of mass media representations" (Macnamara 2009, 16). In general terms, semiotics then begins with identifying signs and their dominant characteristics, before then turning to the analysis "as a result of selection and combination" (Ibid.)

Semiotics follows here the approach of *layering meaning* (Leeuwen & Jewitt 2001, 94): "The first layer is the layer of *denotation,* of 'what, or who, is being depicted here?'. The second layer is the layer of *connotation*, of 'what ideas and values are expressed through what is represented, and through the way in which it is represented?'" (Ibid.). This aims at understanding, much similar to content analysis, the identification of underlying meanings along codes – in this case the signifier and the signified.

The former involves also categorization of the represented, through which also culturally immanent readings of the videos are being made visible. Again, much like content analysis, the categorization is achieved along the material. Along with social semiotics (Ibid.), the second step is analytically more complicated, as it aims to de-construct the denotation and identify the "grammar" of the visual, be it stills or moves. For moves, this becomes even more complicated, as meaning is constituted through a flux of images. The units of meaning are thus also for semiotics "turns" and their trajectory. Different to content analysis semiotics does not rely solely on linguistic sources for carving out meaning and how it is being achieved. Rather it can also address visual materials directly. The procedure of the actual analysis remained similar to content analysis, where again themes are to be identified, categorized and inferred. Whilst the more general procedure of semiotics can be compared to those of content analysis, the details must be elaborated more carefully. I applied Semiotics to selected sequences, following Leeuwen & Jewitt's (2001) recommendations and Kress & van Leeuwen's (2006) more detailed "guide" for "reading the visual". I draw largely on their outlines for developing this approach.

3.4| Limitations and Implications: Researcher, Analyst or Viewer?

Objectivity, despite constructivist's criticism of the term, remains an important goal for research. Not implying that researchers can be abstracted from the inquiry in order to arrive at pure factual findings representing reality, but in terms of making the researcher visible. This is particularly hard to achieve when confronted with the inductive approach: The researcher as analyst is simultaneously the "consumer" of the videos. Newbold et al. (2022, 249) stress that "the audience may not see this latent dimension [as regarding to latent instead of manifest variables, as outlined by Macnamara 2005, 15]; the analysis may be longer than the text. The task is time-consuming, and often tells us what we already know in a language we don't understand". Replicability is for this reason an immanent problem of the discussed approaches – and cannot be achieved. This issue may be problematic, but it can be addressed by careful documentation of the analytical processes and the argumentation along the materials in the analysis. The advantages of the methods, as discussed above are considered greater then the limits due to issues of "objectivity" and "replicability" that can be addressed through making both aspects visible within the analysis.

3.5| Techniques

After amplifying the methods, some concluding descriptions of more practical aspects are necessary. This involves transcription; coding, categorization and excel as the primary tool.

Transcription

Transcription was done using the programme "f5".

Coding, Categorization

Coding followed grounded theory and was organized in notes and excel.

Excel as a Tool

Excel provided a powerful tool for analyzing videos. It was the primary tool for analysis, due to its organization in tables. All analytic steps were conducted on separate sheets and changes were tracked. The layout of the table was repeatedly adapted throughout the process of analysis.

Interlude

TWO STORIES ABOUT AGEING, CARE AND TECHNOLOGIES

"The way we care for seniors today cannot scale to meet the looming age wave, and before long we'll face a fullblown national crisis. We have an obligation to our parents — indeed to the next generation of seniors — to ensure they get the best possible care and that they receive it in a place they want to call home.

What we need is a national strategic plan — one that brings together leaders from industry, government, health care, research, and consumer advocacy — to prepare for the aging of our population.

New technology solutions offer great promise to improve quality of care while reducing health care costs. Technology already has transformed our lives — from email to MP3s and from online shopping to cell phones. It is time now for technology to transform the experience of aging"(Introduction-Text[25] to CAST's 2005 video "Imagine: The Future of Aging).

CAST tells in its two videos from 2005 and 2012 stories about aging, and the challenges that elderlies – and their families – may face when growing old or caring for their aging relatives and friends. But more then that, what one is presented with in the two videos, are tales about technology stepping in, improving the experiences of late life, care-work and the U.S medical system as a whole. It is an ambitious vision of future-technology being capable to transform lives in better ways. It are the stories of Ernesto and Alma as the two central fictional characters of the videos and, briefly outlined, CAST tells their two stories like this:

Two Stories

Ernesto's family is facing a severe problem. As Ernesto is coming into an old age (he is 87 years old now), he is increasingly struggling with his diminishing agility and over-all health. Growing old, Ernesto is facing difficulties remembering, e.g. when to take his pills. Something that is troubling even more so, as the variety of pills he has to take is growing due to the different impairments that usually come with aging – and also affect Ernesto's well-being. Further, it has become increasingly difficult for him to move, causing Ernesto to suffer from solitude, as meeting up with Friends becomes difficult. Even though they enabled some variety, regular appointments with doctors and care professionals for medical examinations, treatments and therapy become an additional burden.

This situation is difficult and exhausting, not only for Ernesto, but also for his Family. They are more then happy to "give back" and help Ernesto whenever they can but caring for Ernesto is time-consuming (after all, they have their careers and their social lives) and a full- (or even part-)

[25] http://www.leadingage.org/Imagine-the-Future-of-Aging.aspx

time care worker is just too expensive. The situation is increasingly stressful for all involved, and Ernesto – although no one wants to admit it – is becoming a "burden" for his family.

Alma is coming to an old age too, just as Ernesto she is well beyond her 80ies. And just as Ernesto, she is still living in her own home. Her family is taking over the part of a caregiver and the primary social contact Alma has. And actually Alma is doing very well for her age: She is still active, even works in her garden, cares for her grand-grand-daughter and seeks to live as independently as possible. Yet, her family still has to step in: bringing Alma her groceries, helping out in the kitchen and assisting her in her daily routines. But all in all, Alma is doing well on her own, despite her age - until she suffers a stroke. It is fortunate that her daughter is visiting at that time, being able to initiate medical help immediately.

As we follow the story of Ernesto, we see how technology is ought to help out in caring for Ernesto, monitoring his medical condition, surveilling the intake of medicine and therapy exercises, and connecting him with friends via the Internet. Further, it is supposed to improve the lives of his family making it easier for them to care for Ernesto by delegating certain tasks to technologies or care professionals, by making it possible to check how on him from the distance. And technology also steps in in the case of Alma after the stroke occurred and while she is on her way through medical treatment and back to normal. In this story technologies not only facilitate better and more efficient and effortless (in both meanings) care (professional as well as through her family), they also improve the general quality of care as soon as Alma is back home from the hospital, picking up her live where she left it.

Key-Questions

These videos imagine how care is ought to be improved and transformed in the future (and for a "better future"), or to speak with CAST:

> "Given our rapidly changing world and the demographic implications looming on the horizon, today's not-for-profit aging services provider is at a critical juncture. Will you be able to successfully transform your organization to prepare for the future, while remaining true to your mission? There are many roads to consider—but the opportunities that emerging technologies have to offer may present our most advantageous path" (AAHSA 2006, 8).

But what *are* these futures that CAST develops in its videos? What is this story about, after all? Is it the future of aging, as the title of the first video suggests? One about High-Tech Aging, even (as the 2012-video is titled)? And what do the future-visions tell us about CAST's understandings and interpretations of care (as organization and practice) in its current state and future-transformations? And what is the place of technology in this vision, with what implications for those supposed to be living with it in the future - and those developing it today?

In my analysis I am going to follow-up on these questions and go into the details of visual and rhetoric representations of age and late life, ambient assisted living technologies, and care – and connect depictions of aging, care-work and technologies and their composition that establish CAST's future-visions. What are these future-visions about and how are they composed

rhetorically and visually in order to make them meaningful (for whom)? And how are they, drawing on the problematization of late life, establishing the technological fix promoted by CAST and positioning itself so powerfully?

Structure of the Analysis

In the following chapters I am going to discuss how CAST represents and stages ageing and late life, technologies and care both, rhetorically as well as visually. I will carve out key means for establishing its future vision and its powerful discourse of late-life-deficits and their technological fix, impacting the representations and understanding of age, AAL and care.

For doing so, I am going to discuss in **chapter 6** the US eldercare system and how LeadingAge CAST as the "author" of the here-discussed futures must be situated and understood within it. This will become important throughout this study: for understanding the social shaping of the futures promoted and imagined by CAST. Do provide the necessary background information on CAST, I am going to discuss in this first chapter the basic character of the US eldercare system and the quite unique position CAST takes within it.

Whereas the **chapters 7-9** will elaborate on representations of late life, AAL-technologies and care, and their more immediate implications for how the "reader" of these representations can understand these themes, chapter 10 will not only bring the four themes together, but also take into consideration how CAST utilizes these representations for orchestrating its future-visions.

This endeavor is ambitious in this sense, as there is a lot to be discussed. This also means that there is a lot to be left aside our to be touched upon only briefly. So what is there to be expected? This section investigates representations of futures and what this future represents. Accordingly, this will be the red line running through the following chapters: How is the present problematized in order to promote AAL as "technological fix"? Whereas the general themes of the sections – aging, caring and technologies – will be of major concern here, the thoughts presented in the following chapters will also come across other topics. Some of these topics will turn out to be of high relevance for the construction of CAST's future-vision and how to understand it (as for example the notion of risks). Others may be relevant and exciting to think about in this context, yet go beyond the questions addressed in this study – and thus must be left aside (as for example the disambiguation between "data" and "information"). Those questions could constitute the content of further investigation on the topic.

Chapter 6

SITUATING LEADINGAGE IN THE US ELDERCARE SYSTEM

Let begin with rehearsing a story that has been told so often, it seems arbitrary: People tend to live longer. This exciting news is voided by concerns that arise from a multiplicity of factors: the privatization dynamics of care, labor market pressures and rising costs of formal and informal care facing increased demand for these services. The good news of longer live-spans, in combination with an increase of life-years spent in health, in this story is commonly contrasted by the bad news of what has been termed as "care crisis". It is a story that seems familiar, as one encounters it in media, politics, and everyday life. In current debates around aging ("silver society", "ageism", "demographic change"), we encounter these debates.

The dynamic has been connoted mostly negatively, being coined "demographic change" or "aging society", and becomes associated more and more with a notion of downfall and severe societal challenge. It is not by coincident that the "aging society" is one of the key-pillars of the European horizon 2020-framework, as it is addressed as one of the "societal-challenges".

Different nations pursue their own strategies in how to cope with these dynamics. Differences that are associated with larger market-ideologies – and largely also associated with the strength (or weakness) of the social welfare states: "Social policies reflect the value systems and societal structures of the society in which they are developed" (Brooks, quoted in Keating et al, 1997, 23). Also care is organized differently depending on countries and regions– and the "crises of care" gets addressed in varying tunes. Eldercare in Austria, for example, is organized largely by state-programs, housing options are relatively well accessible even for low-income cohorts due to governmental financing options, and even home-care in a high standard of quality is more or less accessible across different economic milieus. The situation shows to be quite differently in the US.

Silvia Federici draws a quite negative picture of the eldercare sector in the US. The US eldercare sector follows that of liberal market logics. Federici points towards the under-valuation of reproductive work, including care work for elderly, resulting in a largely privatized care sector. Whereas state-funded nursing homes are facing challenges of low budgets and provide only poor care, hospitals' services have been generally in decline, and this is true even more so for care-services for elderly, resulting in primarily informally organized care, where care-work is provided at homes and mostly by women or poorly paid care-workers:

> "The demise of welfare provisions for the elderly has been especially severe in the US, where it has reached such a point that workers are often impoverished in the effort to care for a disabled parent. One policy in particular has created great hardships. This has been the transfer of much hospital care to the home, a move motivated by purely financial concerns and carried out with little consideration given to the structures required to replace the services the hospitals used to provide" (Ibid., 239).

Whereas in many European countries, issues addressed within the challenge of "aging societies" largely focus on ensuring the quality of care in public care facilities despite increase in demand for their services, in the US problems are located elsewhere and focus mostly on informal care: Here "the problem" centers on questions about how to provide care for ones relatives despite one's own career, how to ensure social inclusion for elderly living at their homes alone, and concerns of financing care that deserves its name. Eaton comes to the same conclusion, when he explains:

> "Problems [...] are growing. The supply of family care for the elderly is likely to decline. The overall quality of paid eldercare is low, and access to it is uneven [...]. Low-income elderly, who are predominantly women, cannot rely on family care and often end up in nursing homes where the quality of care is woefully poor. The structure of the nursing home industry, in which firms are forced to engage in competitive cost cutting in order to cope with inadequate federal subsidies, deserves much of the blame for low-quality service" (Eaton, 2005, 37f).

Unpaid care workers provide a fast majority of care. The professional health care sector in the US, on the other hand, is hard to overlook, as services are provided that mainly focus on "aging in place" (Marek & Rantz, 2000; Kandel & Adamec, 2009, 15) - due to the bad quality of care provided by public care facilities, such as nursing homes (cp. Federici, 240). Accordingly information platforms and associations for elderly and eldercare have spread over the last couple of years, with AARP (American Association of Retired Persons) being one of the most powerful lobby organizations in the US. Levande and Herrick point towards the informal-care-based system in the US, putting especially relatives under large stress and pressures.

> "At least two major agendas for future development have emerged in the United States. The first agenda is finding the right mix or blend of informal and formal services to support increasing numbers of older adults in need of care and relieve some of the stress from a decreasing population of family caregivers. [...] The secon agenda for the future is long-term. The traditional socialization of woman as caregivers must expand to include men." (Levande, Herrick & Sung, 2000, 637f).

And Zapedowska-Kling concludes:

> "The American system of long-term care is one of the most expensive in the world. [...] This means that (unpaid) family support is one of the most popular forms of eldercare in the United States" (Zapedowska-Kling, 2014, 34).

This is contrasted with the social system that mainly funds private nursing organizations. The consumer organizations, such as AARP, IAAHSA and its national branch, Leading Age (formerly known as AAHSA), are accordingly mainly focused on providing information on services to consumers, offer support of various kinds and represent their clients (non-for-profit care service providers) and their costumers (those seeking the care services) towards the government as lobbying. In the end, the situation in the United States is rather convoluted, as also Levande, Herrick & Sung (Ibid., 638f) realize. They give a conclusive summary of the situation:

> "[...] [T]here is no single long-term care policy that guarantees care for the elderly regardless of health status of income. Nor is there a clear, commonly accepted definition of long-term care. Long-term care consists of health and social services, care given by physicians and other health care providers, care given in hospitals and nursing homes, and care given in homes for the aged and in adult day care. [...] The fragmented system of long-term care in the United States involves different government jurisdictions [...]. Major federal policies [...] shape long-term care and are complex and difficult for consumers and providers to understand and utilize."

In this market-driven care-system, LeadingAge established itself as one key-actor within eldercare. As non-for-profit organization it provides services to its costumers, arranged along three pillars. One of the key-services is to provide an overview of, and access to available care-support and services. With 6.000 non-for-profit member-organizations (service providers, governmental institutions, support-groups, research facilities, etc.) it has access to a wide collection of services, and facilitates exchange between those in need for help and those providing services. LeadingAge tries to address key challenges of demographic dynamics in the US. First of all it advocates for strengthening the non-for-profit sector of eldercare, hoping to make good-quality care accessible for a wider public: "As leaders in their communities, not-for-profit organizations are guardians of values, cultivators of volunteerism and stewards of the public interest. LeadingAge is committed to strengthening governance practices to affirm public confidence in our members' mission" (LeadingAge, n.d., *Strategic Plan*, 1). For doing so, LeadingAge is highly active as lobbying institution, which becomes also visible in the Strategic Plan for 2014-2018, where activities for preparing and influencing legislation, influencing governmental decisions and strategies and actively influencing care policies are on the top position its agenda. The activities report for 2013 highlights LeadingAge's activities in policy making, making available funds and strategic support for its members and providing information, education and support for their costumers (cp. LeadingAge, 2013a).

LeadingAge can be positioned within the ideological shift of care, already identified by Keating et al in their 1997 publication. They make out a double-shift:

> "The new policy paradigm of care for frail seniors emerges from this contemporary value stance concerning eldercare. The paradigm has two basic tenets of 'caring partnerships' and 'client-centered' care" (Keating et al, 1997, 24).

In this paradigm "the interface between formal and informal care is the cornerstone" (Ibid., 25), leading to re-directing public funds from direct person-centered funding of elderly to that of service providers. The emergence of new partnerships is made tangible in the spread of consumer associations, the rise of AARP and the role of LeadingAge as interface between policy-makers, service-providers and their costumers.

LeadingAge's activities are focused on its members, organizations that provide different forms of eldercare services. Further, LeadingAge provides information and services for costumers. Finally, LeadingAge also addresses policy makers, for example in public statements commenting legislation and other efforts that can be characterized as more direct activities of policy-making and influencing legislation.

To pursue its aims publishes its own magazine ("LeadingAge Magazine"), hosts and attends conferences and is also active as a lobbying institution, representing their clients towards policy makers. Furthermore, one of the key pillars of LeadingAge's action-plan[26] are the three centers:

[26] *http://www.leadingage.org/uploadedFiles/Content/About_Us/LeadingAge%20Strategic%20PlanFOR%20WEB.pdf*

The Center for Applied Research, Center for Housing Plus Services and the Center for Aging Services Technologies.

Home care has an exceptionally high importance within the US care system. Facing the "aging society"-problematization, issues of balancing careers and providing informal care increasingly gains importance. Accordingly, hopes are tied to new technological innovations assisting informal caregivers. In this context LeadingAge has put technological advance and research as their top-priority in their recent strategy papers, giving their Center for Aging Services Technologies an outstanding role. One strategy paper (LeadingAge, n.d., 2) addresses technology as key-driver:

> "Adoption of technology can be an accelerator of quality and effectiveness in the provision of aging services. LeadingAge is committed to education, research and advocacy to advance technology applications. Advocacy: Lead advocacy efforts to include long-term and post-acute care in innovative, technology-enabled care demonstrations and payment models. Education: Deliver education on adopting key enabling technologies to deliver quality care. Resource Development: Ensure 25% of members have accessed decision-making tools specific to electronic health records, tele-health and medication management" (Ibid.).

In the more detailed "Leadership Imperatives"-Report, this key-role of technology is made tangible. By identifying different drivers of the US health- and care-sector, "technology is potentially the single most important phenomenon that can synergize the other driving forces to assure value for all concerned" (LeadingAge, n.d.-b, 2). With the integration of CAST into LeadingAge, the organization aims to "[a]dvane thechnology understanding and adoption amongst members" and "stimulate state and regional networks connected to CAST" (Ibid., 7). Accordingly, CAST has excessive funds available for the promotion and development of new technologies, and is sponsored also by external funding- and research-partners, such as the Bethesda Health Group, Blue-Orange Compliance, eHealth Data Solutions, HP, Panasonic and many others (cp. http://www.leadingage.org/CAST_Supporters_and_Patrons.aspx). CAST …

> "[…] is focused on development, evaluation and adoption of emerging technologies that will transform the aging experience. As an international coalition of more than 400 technology companies, aging-services organizations, businesses, research universities and government representatives, CAST works under the auspices of LeadingAge, an association of 5,500 not-for-profit organizations dedicated to expanding the world of possibilities for aging"[27].

It aims at development (via coordinated research activities) and diffusion (via promotional activities and a "Technology Selection Tool"[28]) of new technologies, active policy-making to secure funding for development and implementation of technologies, and develop a common strategy for advancing technological innovation for health care (cp. Mission Statement; Cast Functions[29]. In this, LeadingAge extends the story of demographic change with technological optimism. The videos that come to analysis in this study were published by CAST to highlight their agenda and provide a "vision" of what the (technological) future of aging may hold – and how technologies are imagined to be part of the solution of aging societies and increasing pressures on the eldercare-sector in the US.

[27] *http://www.leadingage.org/CAST_Mission_and_Vision.aspx*
[28] *http://www.leadingage.org/Technology_Selection_Tools.aspx*
[29] *http://www.leadingage.org/CAST_Mission_and_Vision.aspx*

Chapter 7

PERFORMANCES OF AGE AND THE DEFICIT MODEL OF LATE LIFE

Do you consider yourself old? You do? Great! But how so?

In this chapter I am going to raise this question, and particularly in regards to how CAST "understands" aging: What is considered being old, and how it is signified, is the guiding question in this chapter, asking for how age and particularly late life are staged, performed and represented. First, in **sub-chapter 1**, I am going to discuss how late life gets performed and staged in terms of fragility – and how this is built upon a deficit perception of late life. I am going to discuss the representations of late life in terms of fragility and ask for how this fragility is established? Thereby I argue for the elderlies' bodies to be the main vehicle for staging fragility. These bodies:

> are a) associated with making mundane tasks challenging;
>
> are b) contrasted with younger and superior bodies to establish a hegemony of adulthood and stage elderly bodies as insufficient and cause for marginalization
>
> are c) subjected to cognitive impairments that impede the adequate self-care and –maintenance of bodies.

In **sub-chapter 2**, I am going to discuss how late life is continued to be framed on terms of a deficit model of late life and how this feeds into a marginalization of elderlies that urges intervention and opens up room for improvement.

In the **third sub-chapter** I am then going to discuss the notion of successful aging, how it is built upon the deficit model of late life and frames what is necessary to overcome the negative aspects of late life. I am going to argue that the ideals of adult life (young, efficient and productive bodies) is mobilized here and utilized as a normative goal for elderlies. I am also going to outline how the concept of autonomy and its understanding, as facilitated by CAST, feeds into the deficit framing of late life, where success in aging is mainly understood as freeing carers from the burden of providing assistance to fragile elderlies – thus suggesting autonomy to be understood as a means for establishing the necessity for improvement of care and late life. This will then allow me to highlight in the concluding **fourth sub-chapter** the central aspects of the deficit model of late life as a key dimension for CAST to establish its future-visions.

Asking the seemingly straightforward question of "how old are you?" appears more challenging. After all: Who is not familiar with the young but exhausted sitting at the next table at the café, explaining: "I feel like I am 50!" Who has not heard someone stating that one "may be 50, but I feel like 40 and live like in my 30ies". So you are old, you say. But what do you mean by that: that

you are beyond your 50s? Your 60s? Your 90s? Or is it the way you feel: That you are tired, maybe? Do you have difficulties remembering names, so that it makes you say you are old? Is it the age of your body or your mind that you are referring to? Or is it that you cannot understand the urban slang anymore? Are you more often browsing the urban dictionary than you are on Instagram? Is it the music your daughter is listening to that you "just cannot understand"; that makes you say you are being old? Is it your son's newest found hobby that "my generation never would have liked?" Or are it the phones in the hands of your friends and the things they are doing with them? Bodies, minds, or societies? Or simply your health – and which one (that of your mind or your body)? Or the simple numeric expression that marks the time you have been on this earth? What is your age? What is it that makes you quote Gustav Mahler, saying "I have lost touch with the world"?

1| Performing Age in Bodies, Mind and Society

When I start off with focusing on aging and its representation, the first question regards aging bodies: How is late life signified as such? Is it the arrangement of bodies in certain contexts? Or is it how these bodies (inter-)act in social context? Or in other words: Is age tied to aging bodies, as a mere biological dimension, or referred to as a social construction, established in and through the reactions of the social environment, the behaviors of the elderly and the (social) worlds they act in: rooted in culture? And what is the place of the (aging) mind in representations of elderlies? Mike Featherstone and Andrew Wernick pose this biology-culture problem in their edited book "Images of Aging". They explain a lack of reflection about the interplay of bodily dimensions of aging and the social construction of age:

> "To highlight the importance of the body for the study of aging, then, is not to raise the spectre of biologism, the reduction of culture to the biological, nor is it to vaunt a social constructionism in which the body is conceived as a blank slate on which culture can write at will" (Featherstone & Wernick, 2003, 2f).

Turning to the visual and rhetoric performance in the videos, this problem becomes quite tangible: One could make the case for bodies in the videos merely moving through the flux of images, while it is society that constitutes what age means. On the other hand, one could argue that these social reactions are only the result of the alienation with different bodily capacities. I suggest something else: thinking both together. This allows thinking about the association of capacities and characteristics with age, performing them either as aspects of the body, the mind, or culture and society.

Fragility is a central means for establishing age in the videos via the display of dispositions of the body, the mind and also social dispositions. This signifier for ageing builds on stereotypical representations of late life in terms of incapacities. It is a well-deployed stereotype in framing elderly, particularly in contrast to younger adults – often referred to in terms of second childhood or mask of aging: "One of the particularly powerful images comes from consumer culture. It is the image of young, fit and beautiful people juxtaposed with images of overweight, sickly and ugly

bodies", as Neven (2011, 31) explains, and the construction of fragility in and through such juxtapositions is one key cultural repertoire for framing late life.

A strong emphasis is placed on constructions of fragility in the performance of late life in the videos too and is mainly visualized via the body. Fragility of the body gest associated with aging through the mobilization of stereotypes: We encounter Alma and Ernesto as elderlies that walk slowly, have difficulties in operating mundane objects (cutting food, for example), and are shown as relying on bodies that appear increasingly insufficient. The performance of late life as a bodily dimension is a crucial repertoire for performing age and situates aging via such dimensions. In fact, as I am about to highlight with selected examples from the videos, fragility is the central notion for referring to old age in order to establish what I am going to call the "deficit model of late life". Let me turn to the four key repertoires for performing fragile late life.

1.1| Repertoire 1: Performance of Fragility in Mundane Tasks

This is visualized in tasks that seem mundane: Cutting tomatoes or climbing stairs, lifting heavy objects and hugging persons place aging within everyday practices. The expression of bodily fragility – which encompasses fragility resulting from medical insufficiencies as well as more subtle incapacities - gets expressed via three key vehicles: performances of body-movements and gestures, performances of bodies in medical terms and performances of young bodies as contrasting device. The first vehicle for performing fragility is encountered in daily practices that seem mundane and frame their difficulty as particularly challenging and marginalizing:

Image 1 (LeadingAge CAST, 2005, 1:36): Ernesto is having increasing difficulties to climb the stairs to the porch of his house. We witness how he is taking it step-by-step, stabilized by his walking stick he is leaning onto.

Image 2 (LeadingAge CAST, 2005, 2:59): In another sequence he has difficulties in placing the knife on the tomato he is about to cut. He has to give it another try. He has to re-position the knife repeatedly before he feels save enough to make the cut. It's a shaky operation and he's in danger of cutting himself. He needs all his concentration for making the cut. The mundane task of preparing food, yes already of cutting one single tomato, becomes dramatically less mundane: it becomes dominating and highly problematic.

When Alma moves through her house, in one sequence of the 2012-videos, her steps are careful and she moves slowly. The risk of stumbling, falling and hurting oneself seems omnipresent in such a mundane task as walking. It stops being mundane, as there appear new risks and new challenges. The fragility of their bodies is performed in these mundane tasks and makes them appear challenging (both, the bodies and the tasks). Everything takes almost exhaustingly long. Age is framed as an issue of deteriorating bodies that affect daily life.

Fragility is clearly situated in the domain of the body, as it becomes an obstacle for accomplishing simple tasks that should not be an obstacle at all. At least: not for *normal* bodies. In such depictions fragility becomes dominating, as it places attention on these otherwise arbitrary tasks. Issues of non-concern become concerns and problematic: Cooking is framed as problematic, as cutting tomatoes is, when it is carried out by elderly person - and even dangerous and risky when it comes to forgetting to turn off the stove. Insecurity in walking becomes associated with the concern of falling. Bodies are performed as fragile in order to make them visible: they become problematic and matters for concern, reflecting back onto identities. Yes: The depiction of elderlies in fragile bodies serves also as marker for age, as it mobilizes a stereotype that is well-established in western cultures. We encounter this stereotype repeatedly in mass media, mostly in playful manners[30]. First of all the depiction of fragility in carrying out mundane tasks results in grouping the shown person in the category of "old age". Yet it is more then that: Despite signifying age itself, this framing puts blame on the body as source for – at least - inconvenience.

The problematization of fragility in mundane tasks is performed mainly via visual vehicles. It is not verbally addressed explicitly by characters of the films or a narrator, but provided in depictions of frail bodies that are confronted with challenges mundane tasks pose to them. This performance allows associating identities with age and to frame everyday life as arduous.

1.2| Repertoire 2: Performance of Fragility in Medical Bodies

Diminishing health and decreasing capabilities of what "the body" allows fosters the impression of fragile bodies. Medical aspects of aging bodies get mobilized to further emphasize this representation. The association of age with medical illness is central for substantiating the notion of fragility. This is already established in the beginning of both videos rhetorically:

> Ernesto's Doctor: "For a man of 87 Ernesto is not in bad shape He's got typical problems we associate with a man in his 80s: Which would be congestive heart failure, arthritis, some cognitive impairments."
> Son: "I mean he was the guy who was always there, he was the one who was always trying to help people. And now he's the one who needs help (LeadingAge CAST, 2005, 00:10 – 00:36).

The notion of diminishing health is strongly associated with aging in this statement taken from the 2005-videos on the occasion of introducing Ernesto. He is immediately framed as being of old age and simultaneously deteriorating health is explained to be "typical". This is connected with

[30] as for example: *http://tinyurl.com/mcrmk8v*,

needing help as result of his aging that entails health impairments "by nature". The same is the case for Alma: She is also associated with age and illness, although being described as doing well in her aging:

> Alma: "I have my aches and pains for sure but I never thought I would live on my own in my 80s." (LeadingAge CAST, 2012, 01:20 – 01:23)

And:

> Daughter: "I hate seeing my mom get old but I think what impresses me most about her aging is that she is taking charge of it." (Ibid., 01:55 – 02:05)

While the "aches and pains" are not specified, it is framed as "impressive" not to be affected by them too much. These verbal statements associating health and age are then underpinned by depictions of aging bodies in their fragility. Even if bodies don't fail, this is all but normal and thus impressive. This more positive depiction of aging is still placed in the backdrop of negative stereotypes. The aging body remains typically a failing body. The mobilization of stereotypes then also function via showing their positive pendants, by referring to them in notions of abnormality. Hazan points out that elderly not fitting the image of being frail, fragile and sick get shown as exceptional or even freaks of nature: "Any exception of the image of the elderly person as sick is perceived as enigmatic" (Hazan, 1994, 20).

In the case of Ernesto this is visualized in instances where he goes to "see the doctor", a notion that rehearses stereotypical impressions of aging as increasingly in demand of medical treatment. Objects of this treatment are the bodies of the elderly, both Ernesto's and Alma's. Specifically in Alma's case the association of age with failing bodies takes a central part in the overall narrative. Here it is a stroke that brings Alma's "impressive" story of success to an abrupt end.

Image 3 (LeadingAge CAST, 2012, 2:12): This disruption is depicted in a hard cut, as the video keeps unfolding: While her daughter is telling the camera (and thus the viewer) how well Alma is doing, she collapses. One hears a bumbling noise. The daughter, finding her collapsed mother, is panicking, screaming for help, the camera is shaking, and the background music stops abruptly. Alma has a stroke.

> (bumbling sound in background, interrupting the daughter talking)
> Daughter: "-Mom?" "MOM?" MOM!? . . Where is my phone" (sobbing) "Daniele! Bring me my phone! I think grandma had a stroke!" (LeadingAge Cast, 2012a, 02:03 – 02:21)

In this turning point of the 2012s Video's narrative the body ultimately fails. In such a portrayal, bodies bear invisible risks that get associated with their aging. Medical aspects of bodies that signify them as failing and fragile are important markers for late life in the repertoire of the videos. Here fragility in its medical dimensions is also an important vehicle for performing elderlies' identities as concerned and affected by failing bodies. As their bodies become

problematic for maintaining "normal live" (i.e. one that is free from impairments), a medical understanding of elderlies dominates their identities. This is rehearsed in difficulties encountered in carrying out mundane tasks and is substantiated by relating it to medical conditions.

The importance of such a framing for establishing the elderlies' identities becomes visible in the large portions in both stories that are reserved to establishing it. Both in rhetoric statements as well as in visual depictions Alma and Ernesto get associated with medical concerns: We encounter doctors and relatives referring to them in terms of their medical condition, just as we *see* both of them suffering from medical impairments.

1.3| Repertoire 3: Performance of Fragility in Contrasting Old and Young Bodies

Contrasting elderlies failing bodies with younger, active ones is another mean to establish this bodily insufficiency. In such depictions younger bodies are capable of accomplishing tasks older bodies are not. The medical nurse that helps Alma getting up, her grand-grand-daughter and her more active habitus, the son hugging Ernesto with a different (more active) dynamic then Ernesto's. And when elderly are out of the picture young bodies are depicted as being far more active then it is the case for depictions of elderlies: they (young bodies) are hard-working, lifting heavy things, and perusing their lives in active ways. On the other hand, live seems to be *happening to* elderlies, again underscoring the discrepancy between elderlies and younger bodies: The videos construct elderlies far more passive and fate strikes unexpectedly.

As Hockey and James argue, summarized by Featherstone & Wernick, "[t]his too has an embodied aspect, for the frail elderly, especially those in 'deep old age', the over-80-year-olds, are often dwarfed by the bodily presence of a young nurse or attendant. Ageism can therefore operate through the dominance of images of dependency which take away the adult status and personhood of the elderly" (Ibid.). Hockey and James explain:

> "Images of physical decline and social marginality are invoked and, whilst rarely having 'validity as accounts of how people see themselves', none the less act as powerful symbolic markers of identity which are used to attribute characteristics to others" (Hockey and James, 2003, 135).

Image 4 (LeadingAge CAST, 2005, 2:14): We encounter Ernesto's family working hard in their small gardening business, where they lift heavy objects, have to move fast and are generally portrayed as leading a busy life. Old bodies become a burden to young ones. They slow them down: The young body has to adjust to the speed of walking the older one is only capable of. It simultaneously reminds the older body of what it cannot do, what it has lost. In the videos, young bodies are shown how they hand things to old bodies, how they comfort them, assist them in activities, make the bed for them or operate devices. Older bodies become a burden for young bodies, as they demand adjustment or

assistance. This construction of dependencies is achieved also when depicting only young bodies: Relieved from the burden, the old and aging bodies get performed as, they start moving faster and become more active. In the absence of older bodies, young bodies are staged as more active. They function as contrasting-device making insufficiencies of older bodies visible. Elderly-bodies are perceives as deviation from the bodily norm (i.e. healthy adult bodies). This contrasting then not only allows fostering the fragile framing of elderlies in their aging bodies, but establishes their social marginalization: Old bodies become a problem for younger ones, they need to be taken care of and demand resources for doing so.

This establishes healthy bodies of adults as wishful norm, particularly through the techniques of contrasting: The dwarfing effects of the mere presence of young bodies that are shown to be superior to the incapable, sick ones of elderlies substantiate this impression. Whereas it gets constructed as normal and typical for elderlies having to rely on increasingly fragile bodies, it is simultaneously performed as not being the optimum: this rather being the young, active and capable bodies of adult individuals. Healthy bodies are presented as the norm and act as a counterpart to the insufficiencies of the elderlies. Consequently, the problem is located in the bodies.

1.4| Repertoire 4: Performing Aging Minds as a Matter of Fragile Bodies

When aging gets constructed as endeavor of caring for increasingly fragile bodies, taking care of bodies becomes a major issue. Accordingly, the videos problematize the capability of elderlies for taking care of their own bodies. Failing bodies get associated with loosing control of ones body and aging becomes an issue of the mind. Here the two videos take different stances on how issues of deteriorating mental abilities are addressed: Whereas in the story about Ernesto cognitive impairments are broached as an issue, they remain unaddressed in the later video corpus. Different to the case of Ernesto, this issue is left aside in the story about Alma as an explicitly addressed issue. She is shown to be mentally fit. This has to do with a stronger medical narrative, where Alma is shown to be an active aging person, living relatively free from impairments at her own home in her 80s. It is the stroke that causes difficulties and makes caring for her a problem: Accordingly medical treatment revolving around therapy and "getting her back to normal" becomes addressed here, rather then cognitive impairments. Interestingly enough, this is quite contrary to recent debates in gerontology and other fields, where increasingly cognitive aging is addressed as a major issue.

As in the case of Ernesto, we find a number of instances where actors refer to his deteriorating cognitive abilities. His doctor explains Ernesto's condition as follows:

> Doctor: "For a man of 87 Ernesto is not in bad shape. He's got typical problems we'd associate with a man in his 80s: Which would be congestive heart failure, arthritis, some cognitive impairments" (LeadingAge CAST, 2005, 00:10 – 00:21).

And Ernesto's granddaughter also refers to his mental condition. She describes how caring for her grandfather is becoming a growing concern and pins this to his cognitive incapacities.

> Granddaughter: "Gosh, it's so much to think about. We have to know if he is, you know, eating, drinking, moving around, can pay his bills on time, make sure he is taking all of his medicine" (LeadingAge CAST, 2005, 02:00 – 02:10)

Yet, interestingly, these impairments get staged as concern primarily rhetorically: There is one instance of depicting how Ernesto's stove is turned off automatically, while his granddaughter explains the fears and dangers associated with his growing oblivion and how technology can help overcoming it. Despite this instance, Ernesto is depicted as mentally fit, lacking signs of mental incapacities one probably would expect: He speaks fluently, has no problems in remembering details of stories he tells to the camera and remembers names easily. Rather then this, aging of the mind is staged as becoming a problem in second order, where Ernesto's cognitive impairments get associated with higher risks for deteriorating health, as he might forget to exercise adequately, take his medication or eat and drink enough. Although cognitive impairments get acknowledged as an issue, their depiction remains vague and it is being addressed mainly by speaking about it.

Instead cognitive impairments are raised as an issue by relatives and medical experts in describing their impact on caring for elderlies: Cognitive impairments are framed as issue hindering adequate self-care of bodies. In such expressions cognitive impairments are also raised as issue in the case of Alma: This appears after her stroke to emphasize that she has lost her ability to self-care. Issues are forgetting to drink and eat and medication intake and thus become a concern of treating bodies in order to maintain them. Other issues of cognitive impairments are masked: Depression, memory loss, personality change or difficulties in communicating ones needs remain excluded. What get shown are fit minds in bodies that loose their capacities.

Aging minds only become a concern for maintaining bodies and are thus managed accordingly: The issue of forgetting to treat the body correctly is delegated to technological solutions that basically take over the task of reminding: to take the medication and how to take them, supervise movement and exercise, monitor drinking and eating-habits. A typical means for depicting this is the smart medication dispenser. He gets shown in both stories prominently and is portrayed as the perfect solution:

> Ernesto's son: "He has a monitor that tells him to take his medicines."
> Ernesto's granddaughter: "He's got his special watch. The watch monitors his vital signs and also acts as an alert."
> Ernesto's daughter-in-law: "It just prompts him to take his meds, it tells him wither or not to take it with water, to take it with food. That's a wonderf- That's a lifesaver" (LeadingAge CAST, 2005)

And also in the 2012 video about Alma we see how the medication dispenser prompts the correct medication in the right dosage at her own home automatically. Another approach to overcoming the issue of lacking cognitive capabilities for caring for ones own body is the delegation to third parties – I will problematize this aspect more carefully in the 9th chapter on "the future of care".

1.5| Four Repertoires for Performing Late Life

When we follow the depictions of Ernesto and Alma in CAST's videos, the subject of bodily fragility builds on two notions: a general discrepancy between elderly bodies and younger ones, where fragility and incapacity to act as one wishes get emphasized and established as typical for late life, yet simultaneously constructing healthy adult bodies as the wishful norm. Here especially the construction of aging bodies as being ill gest established as the root of this problem. A second notion is related to the first one: that of loss. Here, aging is constructed as a procedural suffering. Suffering, due to fragility (associated with incapacities); Procedural, as this fragility increases over time, as aging progresses. Here aging is constructed then as the procedural loss over capacities, increasingly placing elderlies at the margins of society, as they do not match the wishful norm of healthy bodies anymore. This supports the idea of age to be worked on: When in the need of maintaining good health, constant intervention – particularly in regard to the increasingly fragile body - becomes necessary in such framings. Pinning age to bodily dimensions preforms age in terms of fragility that implicates social consequences: the need for care and assistance, for example. This need is performed as rooted in bodily insufficiencies as a deviation from the normal-bodies of adults, rather then society infringing the depiction of age as insufficient (ageism). The performative agenda establishes late life as a problem and locates it within the body as to facilitate coordinated action. In order to overcome potential restraints elderlies are facing, one has to take action upon their bodies.

The co-construction of fragility, bodies and age in CAST's videos functions then as hinge for (technological) intervention. Aging is brought into the domain of medical expertise repeatedly: Providing professional care is mostly carried out by medical experts in the depictions and we see doctors and medical nurses involved in providing treatment and care to both Ernesto and Alma. Through such a construction, aging is a matter of medical intervention: In order to manage the marginalizing effects of aging due to the bodily deterioration, interventions targeting the body are required. As fragile bodies get framed as important factor for CAST to explain the social marginalization of elderlies (in terms of needing to be taken care of), it is this where the promoted technologies are ought to intervene. Louis Neven, in his outstanding doctoral thesis on representations of Old and Aging encounters similar forms of representation, where elderlies are mostly portrayed as frail and thus dependent on formal and informal care. This representation is mostly associated with issues of health and well-being where elderly are shown to be mostly occupied with their deteriorating (bodily) health. Whereas "younger users were discussed in terms of choice, lifestyle and experience, older people were discussed in terms of biorhythms, sleep-wake cycles, melatonin production, visual impairments and risk of depression and were positioned as a 'dependent other' in need of services […]"(Neven, 2011, 168). The performance of age via fragile bodies is then opening up possibilities of interventions directed at these bodies: As the bodies become a concern for the elderlies themselves, their relatives and medical experts.

Accordingly, the performance of mental aging as a matter of capabilities to maintain the body is redirecting aging as an issue of the body, as well. It becomes only an issue as it hinders the elderlies to care for themselves and thus asks for external intervention (constituting the need for care in the first place, yet reminding the audience that the body is the actual subject to care). Aging minds then become an issue for caregivers, only as elderlies cannot take care of themselves anymore. Yet they are not addressed e.g. in terms of identity-building or management of the self: Cognitive impairments do not show to alter identities, but only to reduce capacities that are directly associated with bodies. Here solutions then are again directed to the body instead of the mind, where sleep-patterns, movement and exercise, or eating- and drinking-habits get monitored and controlled instead of targeting the capacities for self-monitoring. Reminders are quick additional fixes for cognitive issues, as it is incorporated in the medication dispenser. Although cognitive impairments get addressed as an issue more strongly in Ernesto's story, and only appear as an secondary issue in the 2012's videos, aging gets in both instances performed as a matter of bodily capacities, their failure and deterioration and as a matter of being able to care for ones body, to maintain it and keep it working.

As bodies age, they are bound to loosing something, namely capacities. Featherstone & Wernick explain: "The bodily betrayals of old age can therefore result in a stigmatizing process which has been referred to as the 'mask of aging', pointing to the inability of the body to adequately represent the inner self" (Ibid., 7). Rather then addressing issues for mental aging, coming into an old age requiring care is bound to the body. Care then becomes necessary as intervention on the body, either when it fails itself, or if the elderly fails to care for his/her body adequately and effectively due to a lack of mental capacities. The critical, stigmatizing characteristics that mark old age are bound to the body and do not match the inner self, making aging a problem and one that is critical. Issues of deteriorating minds, on the other hand, are excluded from the depiction.

2| Aging in a Young Society: Stigmatizing Body-Deficits

Also Hockey and James explain deficit-bodies being strong symbolic markers of identity. The bodily discrepancy between young and old is extended in their social position. Elderly are not only fragile in their bodily dimensions, but also socially. They do not only need care in medical terms (care for their bodies) but also in social terms (care for their social lives). The contrast between fragile and fit bodies is mirrored in the relationship of fragile and fit social existences, as it is also the case for the videos. And just as frail bodies need adjustment through healthy ones, frail lives demand care too. This portrays a relationship of physical just as one of social dependencies.

Late life gets performed mainly in terms of aging bodies. This establishes a representation of the societal position of elderlies that places them on its margins. The establishment of healthy adult bodies as the wishful norm is a key device for substantiating this marginalization. It is the notion of a second childhood that is very much present in these terms, as elderly need to be taken care of,

that loose their status as fully social responsible of their own bodies and life, as they loose their bodily capacities: They are increasingly not considered to be able to take care of themselves. The contrast of adult and old bodies highlights this marginalization (and simultaneously marks elderlies as not being "adult"), especially through the establishment of elderlies as being a burden: Just as children, one has to take back ones own pursue of life and happiness, as those being cared for gain dominance.

> "Deriving from particularized conceptions of children and childhood, these work to sustain a whole range of cultural stereotypes of aging as 'second childhood'. Images of physical decline and social marginality are invoked and, whilst rarely having 'validity as accounts of how people see themselves', none the less act as powerful symbolic markers of identity which are used to attribute characteristics to others" (Hockey & James, 2003, 135).

One performance of this social marginalization is fostered in assigning agency to speak: In both videos we see how the conditions of elderlies are being discussed, be it in terms of medical dimensions, in how they are doing in more general terms, or to describe how they are leading their life. In the 2005 videos on Ernesto we see relatives, doctors, nurses and others making statements about how Ernesto is doing. Yet, Ernesto only makes minor statements. It takes two minutes until Ernesto starts to speak, and also further on his statements are positioned as to affirm other's descriptions on his behalf, not as establishing new perspectives on his. The same can be found in the 2012-story. Alma has a strong social position as long as she remains active in her aging and appears to be successful in it. As long as she has this strong social position, she is also talking on her own behalf. From the very beginning of the video we encounter strong and confident statements where she describes how she is doing:

> Alma: "My name is alma jones. I have been living here in my apartment for 20 years. I love it. I have some great friends. I do what I want when I want. . My great-great-daugther Daniele, she is the light of my life.
> [...]
> Alma: "I teach her how to bake and she teaches me how to google. And now it's me, my daughter, my granddaughter and her daughter - we are 4 generations strong. I am so proud." (LeadingAge CAST, 2012a, 00:38 – 01:10)

This not only stands in strong contrast to how Ernesto is introduced, as he already is positioned on social margins: Others speak on his behalf – and his wish to stay at home appears respectable, but is also presented in a childish-mulish framing.

> Ernesto's Doctor: "For a man of 87 Ernesto is not in bad shape. He's got typical problems we associate with a man in his 80s: Which would be congestive heart failure, arthritis, some cognitive impairment."
> Son: "I mean he was the guy who was always there, he was the one who was always trying to help people. And now he's the one who needs help. We asked him to move in with us - Nooo."
> (end music)
> Ernesto: "I mean why? This is my home. I don't wanna live at their place. I don't wanna bother them. They have their own life to live." (LeadingAge CAST, 2005, 00:17-00:36)

This contrast shows how differently Alma and Ernesto are referred to and thus also positioned socially. Alma is active, and characterized as independent: "I do what I want when I want". Alma also gets shown to be active, as she waters the plants on her own, spends time with her grand-

grand-daughter and is eager to learn about new technologies. Alma is an active elderly in these first two-or-so minutes of the video, bodily as socially: She does the main part of speaking in the video, is laughing and joking (which is also in sharp contrast to the 2005 video about Ernesto). This positive and active representation of Alma establishes a notion of successful aging (that becomes associated with autonomy and activity, as I will come to later on). Yet, this representation is also staged as being impressive (and thus constructed as being highly un-usual): "What impresses me most is that she is taking charge of her aging", Almas daughter explains. The loss of autonomy then contrasts this first success-story in the videos about Alma.

This takes a turn and falls back to a characterization of dependence, as Alma suffers her stroke. She looses here independency just as much as the ability to talk on her own behalf. It are doctors, nurses, relatives that describe Almas condition form now on, just as it is the case for Ernesto. Only when Alma returns back home and regains her independence, she starts speaking on her own behalf again:

> Alma: "That sounds great! There is one other thing bothering me and I just wanna say it. I hate relying on Susan so much. I keep telling her to take this vacation she's been planning." (LeadingAge CAST, 2012a, 5:40 – 5:46)

In this statement Alma not only gains her "complete" personality that matches that of "normal" adults, but she also gains the power to make judgments on other's behalf as well. After all, the doctor encourages Susan to take her vacation.

In the statements on Ernesto's and Alma's behalf, they are positioned as relying on an incomplete identity: They are rather constructed in terms of a second childhood. One dimension is the bodily depiction of elderly that constructs them as marginalized.

> „Through the conjoining of the inner and outer body, appearance has now come to signify the self, with the result that 'the penalties of bodily neglect are a lowering of one's acceptability as a person' [...]. With a 'self-preservationist conception of the body', imaged in the youthful bodies of contemporary western popular culture, the social consequences of this shift in emphasis are considerable [...]. An old, fat or disfigured body implies an undesirable self and a correspondingly reduced social status" (Hockey & James, 2003, 139).

As they show, bodily insufficiencies are directly reflected on the individuals' identities and get rehearsed and re-established not only in the fact, that mainly others speak on the behalf of elderlies (and with that their agency to talk for themselves), but also in the ways they speak about them, that often masks an image of second childhood. For example Ernesto's daughter is calling him "little grandpa". Furthermore, statements of elderlies on their health and general condition are often not entirely trusted. The doctor is necessary to reinforce Alma's wish to send Susan on a vacation. Technologically acquired data is required to verify her statement on that she is not sleeping very well anymore:

> Doctor L. "Yes I see from your monitoring data that your sleep has been disrupted." (LeadingAge CAST, 2012a, 5:25)

Also, the described incapability to care for ones own body is not only associated with dependency, but also with a child-like incapability that places elderlies on social margins. The lack of

autonomy is a well-rehearsed image – and this rhetoric repertoire encompasses notions of dependency upon care, not being able to life on one's own behalf and becoming increasingly incapable, all of them marginalizing the social position of elderly.

3| Performing The Good, Bad & Disabled: Success and Autonomy in Aging

Successful aging is a central notion in the videos in order to establish these discrepancies of elderlies' identities either taken serious or not to be acknowledged. As such, success takes an important place within the repertoire of age-performances applied by CAST. This form of representation stands for overcoming bodily deficits that are typically associated with old age. "Successful" in their aging are those that are able to function despite their bodies' resistance to work properly: They remain active and independent, breaking up the relationship of dependency with their younger equivalents that result from failing bodies. This becomes particularly visible in comparing the first minutes of the two respective videos. The first one shows Ernesto being frail. Accordingly, the relationship with his family is characterized through strong dependencies: Ernesto is explicitly portrayed as being in need of care through his family. Alma, on the other hand, is shown far more active: she approaches her life actively, hardly being impaired, and shapes her life according to her own wishes: "I do what I want, when I want". Being as active as Alma is, as successful in her aging, is all but normal and contrasted with the stereotypical image of elderly dominating the western perception of age and aging. Although it is not shown explicitly, fragility remains the typical attribution to elderly even in the depiction of Alma's successful aging. Simultaneously this unusual depiction of elderlies (also in terms of being unusual or exceptional in her identity) establishes her well-being before her stroke in terms of a wishful norm: She resembles an healthy, adult body that she is capable to take care of on her own.

The relationship with Alma's family gets characterized as far more independent and emancipated, as long as she remains successful in her aging: Spending time with her family is depicted as living together on equal terms and as a joyful endeavor. Alma offers her relatives just as much as they offer her: "I teach her how to bake and she teaches me how to google", is how Alma describes her relationship to her grand-grand-daughter. Whereas Ernesto remains marginalized, Alma is not marginalized at all, as long as the stroke did not occur.

There are a number of means to establish a framing of being "successful" that include performances of successful bodies, minds and social positions. Alma's body is constantly moving whilst she is successful in her aging (be it with or without the assistance of technologies). She is cooking and baking, her gestures are active and variable and she actively approaches her social environment. Depictions show her how she is baking together with her grand-grand-daughter, how she is watering her plants and cooking her own coffee:

> Alma: "When I was a home-health-nurse we used to see patients for a 30 minutes session and then they were on their own. Or sent to a nursing home. But look at me. I making my own coffee in my own kitchen" (LeadingAge, 2012a, 1:39-1:42).

As her body is not "acting up" against her mind, Alma is capable of doing as she wishes, not being impaired and thus also maintaining her full social status, where Alma has something to offer to her family:

> Alma: "[…] My great-great-daughter Daniele, she is the light of my life. I teach her how to bake and she teaches me how to google. And now it's me, my daughter, my granddaughter and her daughter: we are 4 generations strong. I am so proud" (LeadingAge CAST, 2012a, 1:10 – 1:16)

This stands in sharp contrast to her and Ernesto's "unsuccessful" aging. It is performed via the body: Movement seems difficult, gestures become minimal, and these bodies are mostly sitting and lying, whilst more active movement remains excluded from the depiction. The social (inter-) actions are portrayed similarly: Ernesto, when he is successful in his aging, interacts with friends as he plays cards, celebrates his birthday with his family and laughs a lot. Alma gets shown baking with her grand-grand-daughter or encourages her daughter to go on the long-deserved vacation – or in other words: is starting to care for her family again, rather then they caring for her.

Success get performed rhetorically as well as in the depictions. When Alma and Ernesto are shown to be successful, the visual repertoire is built on activity – showing elderlies having the capacity to act on their own. They do not need assistance in their tasks and are shown to do well on their own. Be it Alma who is caring for her plants or baking with Daniele, or Ernesto who is playing cars with friends, taking his medication on his own or celebrating his birthday with his family as an active member of the social group. Rhetorically this is constantly re-enforced through acknowledgments: "He is doing well", "she is taking charge of her aging", and similar statements serve as positioning Alma and Ernesto as successful individuals.

Notable is the positioning of the body as a crucial factor in whether one is able to be successful in their aging or not. Only if what gets staged as bodily concerns is managed not to dominate elderly identities, they are capable of being successful: Concerns of medication intake, capabilities of movement, etc. must be under control in order to lead ones life on their own terms. Success becomes thus a matter of management of bodies that need maintenance and adequate care in order to keep them from dominating the elderlies' identities.

Activity and autonomy are central means for performing successful aging. Passivity and dependency their respective counterparts attributed to what is constructed as fragile, stereotypical elderlies. This construction associates entities successful in their aging with not being as reliant on care, and caring gets portrayed as an overwhelming and exhausting practice resulting from success in aging not being achieved. Autonomy is positioned as a central wish for elderlies: Staying at their own homes and living their lives independently. Such a depiction facilitates a deficit model of late life, where success means not being perceived as one that ages:

> "The model of successful aging developed out of the activity perspective. To age well, individuals were to lead lives that avoided disability and disease, and thereby maintain mental and physical capacities that facilitated productive and social engagement in society […]. The key to 'successful aging' was seen as the continuation of activity in older age and retention of values typical of those in middle age denying the onset of old age" (Foster & Walker, 2014, 2).

Success in aging means preserving ones status as middle-aged adult, well positioned within social relations, and perceives aging as a bodily deterioration that affects ones social and mental status. Such a deficit perception of age as a negative deviation from normalcy (which is equated with middle-age) runs through the performances of age in the videos: elderlies get acknowledged as having a strong identity only to its full extent as long as they remain healthy and do not seem as old as they really are. Repeatedly, this view gets rehearsed in statements where someone is described as "doing well" which is framed as unusual: One is doing well means not being as old as one seems and thus being a "better" individual.

As such, late life gets reduced to bodily incapacities that need to be surmounted. Aging as such is performed as bodily insufficiencies that reflect back on elderlies identities to be insufficient too. What gets established is a deficit-logic of the body that must be restricted from domination. Aging as such is then also framed as a negative property and good aging implies masking ones aging as such. A "good" elderly is depicted with the same characteristics as middle-agers are.

3.1| Establishing a triple-win: Ambivalence in "Autonomy "

Autonomy is gets continuously emphasized in framings of AAL. It is a means for justifying the development of new technologies as it gets sketched as its ultimate ends (cp. Zwijsen et al., 2011, 421ff). This is also the case for the videos, where the need for autonomy, although mostly not addressed in such terms, takes a strong part in representations of elderlies, technologies and care. For doing so, autonomy is placed as the central wish for elderlies. Both, Ernesto and Alma express this wish of aging at their own terms in their own homes. We witness this image in Ernesto being reluctant to moving in with his son and daughter-in-law. And we also encounter it as Alma expresses "I do what I want, when I want". Such representations of autonomy build towards a notion of being free of the need for care through others: In the end, autonomy is restricted to a notion of being at ones own home and being able to take care of ones' own bodies and life. On the terms of elderlies' this depiction favors a specific style of aging that gets expressed as „good".

"Successful aging" is portrayed as a "good" way of aging: Being active, more or less independent and autonomous and thus also a "cheap case": Elderlies being autonomous are not of any greater efforts for their families or the medical system, as they are capable of taking care for themselves. This is contrasted with the "bad" way of aging, where elderly are increasingly dependent of their relatives and the medical system and also get increasingly expensive to be "maintained". Yet, this construction is not about a "essence" of aging, then it rather associates one way of aging with a positive image and contrasts it with a bad version where everyone is suffering: Care work is underpinned with the notion of being a burden, rather then portraying it e.g. as rewarding. Further, this "bad" way of aging is portrayed as being inescapable, as it is particularly explicitly shown in the case of the videos about Alma: Aging, as successful as it may be, is always to be associated with indivisible risks of loosing this success in the backdrop of deteriorating health.

Here elderly are ought to stay out of the medical system, lowering overall health costs, but also should not be a burden to their families, as they are ought to remain capable of pursuing their own lives (mainly in terms of productivity, as this is mostly associated with careers that are ought be followed). The good elderly is "free" of incapacities, and remains autonomous as deteriorating health is managed by experts and thus becomes mostly a non-concern for the elderlies themselves. Building on a strong notion of potentially fragile elderlies, autonomy then turns out mostly means "not being a burden", neither to families nor to the medical system. Although the discourse in the videos focuses on the well-being of elderlies, it ultimately builds towards relieving the pressures a growing population of elderlies puts on the medical and care systems. This implies that being dependent on care is "bad" in so far as it is constructed as mainly being a burden (and who would want that to be?). Only the technologically upgraded elderly, as I will elaborate in the upcoming chapters, is staged as capable of decreasing the demands he places on his environment, be it care professionals or relatives who exercise care work. The underpinning discourse here negotiates the position of elderlies within larger society: And it constructs their "exclusion" as primarily goal. "Exclusion", as elderlies themselves become a non-concern in terms of medical and care-work. A do-as-you-wish (-as long as you do not become a burden) is embraced here, and gets subsumed under the notion of autonomy. Being capable of acting as one wish to, in the end, entails to being able to do so without the help of others, be it medical or social in its character. The disconnection of bodily parameters of deteriorating health through their management by external experts with the social self of elderly is shown to achieve this "autonomy" through the intervention of technologies. As it is illustrated in the upcoming chapters, technologies become mediators in establishing a relationship of power and responsibility between experts that become risk-managers, and elderly that are ought be "freed", made "successful" and thus become "autonomous" through establishing non-concerns (of ones own health for the elderlies, and of being a burden for care-providers).

> "Thus the rhetoric of choice, lifestyle, experience and pampering has disappeared virtually completely. Instead there is a rhetoric of acting tin the best interest of older people, helping them to live at home, to deal with their illness and monitoring them for their own good. Importantly, this is often positioned as good for the older person. But also for society" (Neven, 2011, 80).

How this relationship of power is exercised and what it implies for the organization and orchestration of care must be the main inquiry of the following chapter on "the future of care". To be able to do so, we need to get a clearer understanding of the imagination of technologies in the respect of aging, as it is illustrated in the videos, first. This will be carved-out in the next chapter, before bringing together the insights of these first two chapters when I am turning to care itself.

4| Aging and the Deficit Model of Late Life

Embedded is the here-described framing of late life is a wider gerontological discourse, a rehearsal of the well-acknowledged and wide-spread definition of success in aging, as provided by Rowe and Kahn, who

> "[…] maintained that the appropriate lifestyle could result in successful aging, which they defined as (a) forestalling disease and disability, (b) maintaining physical and mental function, and (c) social engagement" (Katz & Calasanti, 2015, 27).

Successful aging in Rowe and Kahn's definition has found its way into aging policies since its publication in 1997 and was transformed in a national age care policy in the United States – and has its European counterpart in the "active-aging"-program (cp. Foster & Walker). And such it serves as guideline for health policies, was formalized by the WHO (2004) in 2001 and was applied in many countries and also the US (cp. Walker, 2002 & 2008). As such, it is also incorporated in LeadingAge's agenda and thus guides the rhetorical framing applied in the videos. This conception of success, yet has become objected to strong criticism, especially in gerontological debates, that strongly follow the arguments proposed by Foster and Walker, as also Katz and Calasanti argue:

> Rowe and Kahn's work sought to combat myths of aging, particularly those that rely upon and promulgate narratives of decline. However, the hypothesis that successful aging is a minimization of declines in physical and cognitive health, or in social connections—rather than as a social location different from (and in conflict with) middle age—shows too little of both the social forces that affect success and the groups' definitions of it" (Katz & Calasanti, 2015, 31).

These debates focus specifically on the framing of successful aging in terms of maintaining an identity of middle-agers and soon criticized the successful-aging-notion that gets also perpetuated in the videos as following a deficit model of late life, following the outlines above.

The deficit model of late life establishes elderlies and late life itself in a negative framing of deficits and incapacities that demand adjustments and corrections. In the videos this is achieved through the depiction of deficit medical bodies and further substantiated in the framing of elderlies not being capable of caring for their own bodies. This is not only expressed in the depictions of how elderlies are performing in their bodies and as they get framed as forgetful and also cognitive impaired. Rather this is further established in the position of elderlies within society, where they get marginalized in terms of second childhood or the mask of aging. Accordingly, elderlies are positioned as passive recipients of care, where interventions and corrections are infringed on them instead of achieved in a co-operative manner (as e.g. suggested by Mol, 2010, or Winance, 2006). Accordingly, elderlies are depicted in terms of deficit, socially as well as medically or in cognitive terms, constituting their lack of a "full" identity that gets taken serious by other actors. Rather, in terms of the deficit model, corrections and adjustments are necessary to achieve a normalization of elderlies' identities that only grant their capacity to act. As long as this normalization is not achieved, elderlies lack agency and thus others must enact on them (and mostly their bodies) and on their behalf.

In such a perspective, elderlies are not capable of caring for their own bodies, neither are they able to express their wishes and needs, nor to assess their status of well-being. And even if they do so, in a perspective of the deficit model these statements are distrusted, due to their social marginalization that impacts their identity, and need the confirmation or dismissal through

another agent, e.g. the medical doctor confirming Almas assessment through the assistance of technologies.

The deficit model of late-life yet is more then a perspective on elderlies: It is also an ideology that impacts the organization of care and the set-up of technologies, but also their justification in the rhetoric of the videos. I will carve out these aspects throughout the following chapters in more detail. Yet, it already becomes visible in the ways "success" and "autonomy" as notions feed into such and ideologically perspective on late life in the terms of late-life that reinforces an impression of deficit-beings. This is then related to the notion of the deficit model coming from STS:

> "Increasingly, the finger of guilt pointed toward what had become known as the 'deficit model,' which assumed 'public deficiency, but scientific sufficiency.' This model adopted a one-way, top-down communication process, in which scientists — with all the required information — filled the knowledge vacuum in the scientifically illiterate general public as they saw fit. There was a flow of knowledge, from the 'pure' source of science in the laboratory to a (somewhat tainted) Bowdlerised variety that was fit for public consumption and was usually disseminated through the mass media. The scientific community was most definitely in control of this flow. Scientific facts and methods were the vital components of public understanding for the deficit model" (Miller, 2001, 116f).

One can establish similar observations for the deficit model of late life – and I will substantiate this impression throughout this contribution. The first aspect here is the framing of late life in terms of deficits that are established – in this case – through the diverse notions of fragility, as describe above. This framing than constitutes social marginalization of elderlies within a deficit logic that demands corrections and adjustments. The second aspect then comes from how these corrections and adjustments are imagined to be achieved and from how these measures of normalization are justified in rhetoric's of deficit. So far we have encountered repertoires for justifying the need for such adjustments – particularly in the contrasting with "normal" adult bodies, in the notion of success and the related idiom of autonomy. Just as in the case of the deficit model of science in society, where the public as characterized as passive recipient of information in order to "understand" science, the same case can be made for the framing of elderlies receiving care as passive actors. I will carve out this perspective further on, as I will also show how such framings rehearse the deficit impression of late life.

In the end, the deficit model will accompany us throughout this contribution. We will encounter it as it feeds into the framing of technologies (as a fix for the deficits) and that of a "logic of care" as facilitated by CAST. But we also will "see" how such framings re-establish a deficit thinking about elderlies and late life, encountering a co-production of late life, technologies, and the organizational and practical logics of care-work. The deficit model will appear as a device for justifying and substantiating the futures imagined in the videos, but also as an ideological device re-assembling the aims and identity of CAST as a social actor with its own aims to construct the futures in the ways it does. I do not claim the deficit model being completely developed, but rather a first prototype. In this, this contribution then represents a way of playing around with this model to see how it facilitates a better understanding of age, technologies and care and also the practices of future-making deployed by CAST.

Chapter 8

(UN-)IMAGINED TECHNOLOGIES? PAINTING BY OMISSION

*In this chapter I am going to discuss the representations of Ambient Assisted Living - as a wider concept of socio-technical care-networks as well as its translation into concrete technological devices. For doing so, I am going to problematize (**sub-chapter 1**) the ambivalence of technological representations and the role of computer screens for staging information technologies. I will highlight the fluidity of the AAL-concept that not only encompasses technology, but also care practices and a concrete understanding of late life in terms of the deficit model. Thus I will show the ambivalence of representations of technologies: Instead of depicting concrete technological devices, the videos are focused on discussing and presenting the conceptual solution that underpins them. Computer screens are the main vehicles for communicating what AAL as a technology stands for in the interpretations offered in CAST's videos. In **(1.2)** I show how screens are established as a window that allows a lurk into the black-box of this staging of technology. This then is further reflected upon, as I am going to discuss in **sub-chapter 2** the visualization of risk and the so-achieved virtualization and trajectorification of elderlies' fragile bodies – relating the staging of AAL-technologies back to the deficit model of late life and its problematization. I will explain how through technologically granted visualization of risks their problematization is only constructed in the first place, and how this allows to re-focus the attention of care to that of bodily incapacities. After elaborating on how technological representations help staging a problem that demands urgent solutions, I will discuss in (1.3) how the fitting technological fix gets finally established – and how then the technologies themselves appear as machineries for establishing the problem they are ought to fix. I will therefore also return to the previously discussed establishment of a triple-win through the imaginary of autonomy and re-specify it through the focus on technological interventions.*

*In the **third and concluding sub-chapter** I am then emphasizing aspects of normalization and social ordering immanent in such representations of technology and relate the technological fix to the deficit-model of late life.*

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1| Omitting and Visualizing Ambient Assisted Living

Both videos paint a techno-future full of omission: It is as if paints a picture of an elephant without capturing it on the canvas: It makes sense, as we inhabit worlds that are full with elephants. As soon as we know that the elephant is always there, we do not need to depict it in order to recognize its presence. Just as we avoid talking about the elephant in the room, CAST paints its picture of the elephant, i.e. a world of omnipresent technologies. After all: We are acquainted with using our phones, familiar with laptops, computers and iPads as important instruments for our work, and we are used to communicating over long distances using ICT. Many of us were born and raised in the age of the Internet and most of those who were not have learned to inhabit these digital technologized worlds nonetheless. Painting the elephant becomes unnecessary and we are able to get on with focusing on more important things. We do not need to show its looks anymore, and rather go on explaining its consequences.

When CAST paints its picture of technologically improved care, it does not draw the technologies that are ought to provide this improvement in all their details. What's shown are the necessary parts: those that make the improved worlds tangible and how they do so. This makes it even more important to understand the elements that assemble this seemingly bright future of techno-care CAST imagines: Who takes part in this world, how do they interact and on what terms?

Technologies themselves may not end up on CAST's canvas, yet they are the grounds for the final picture: Just as the elephant may not appear on the final painting, traces of it still are found everywhere. But what happens, if we don't inhabit the worlds where elephants are common? What, if elephants are not trivial at all? What if we don't know the technologies that make-up the picture? The painting changes its meaning and its interpretation becomes impossible.

1.1| A Mere Sketch, Nothing Concrete, and a Tablet Computer

Let's turn to what actually ends up on the canvas that CAST's videos are. A number of devices get shown and Alma's nurse manager describes them in one key-sequence of the 2012-video:

> Michael Campbell (Nurse Manager): "[…] her [Alma's] care plan consists of three components. One - Telehealth: Alma's doctors will be able to monitor her remotely. Two - in home sensors detect if she's declining or needs assistance. And three - A sleep monitor. This really helps us detect problems early. Oh - In addition Alma will have a personal emergency response system that can automatically detect falls. These systems help alert her caregivers right away. This really is the future of aging!" (LeadingAge Cast, 2012a, 04:04 – 04:35)

Four key technological applications are introduced by Campbell to help Alma in her aging: telehealth, home sensors, a sleep monitor, and a personal emergency response system. Rather than portraying clear-cut technological solutions, they are only adumbrated. What gets shown, are placeholders for technologies yet to be realized and developed: The telehealth-device is depicted as basically allowing to phone-in with doctors, calling them via a video-phone on a tablet computer. It could just as well be Skype that is being shown here. The same accounts for the sleep

monitor, where a sensor gets shown when it is applied to Alma's bed – displayed only for seconds (04:20 – 04:23). One does not get a clear impression of how the sensor functions and what it is used for. It seems like a technology-like-object attached to a bed. And the home sensors resemble common motion detectors for lights. What and how these devices measure, and what kind of services they provide remain undisclosed in the video. The same accounts for the world Ernesto inhabits: The video basically centers around four key technologies: A smart medication dispenser, an arbitrary stove that is turned off automatically (or almost magically) by an invisible hand, a TV that has vague additional features (e.g. a card game that simultaneously acts as therapy tool; an application that allows making video-phone-calls), and various (mostly: tablet-) computers showing interfaces that make data on Ernesto accessible for others. These interface-technologies are the dominating devices in both videos: Computers and some tablet-pcs in the 2005 video on Ernesto, and mostly iPads in the 2012 video on Alma. This last device gets depicted more clearly, as it dominates the representation of new technologies improving care: the screens of tablets and computer. They are the dominating objects in both techno-worlds. The tablet appears in many everyday life situations and is presented as essential almost naturalized object in daily practices[31]. Whereas the other mentioned technologies remain on the boundary to their invisibility and only get shown on a scale of seconds, computers dominate the depictions of technological objects.

Image 5:

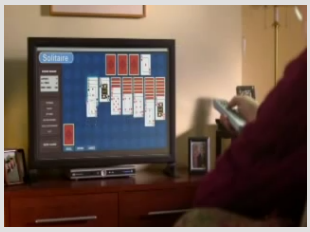
The videos remain vague in depicting most AAL-devices. Most of them are shown only for seconds and remain otherwise unclear (e.g. in regards to their technological set-up or more generally what they are ought to provide and do). Here are the devices that get depicted in the videos.

Medication Dispenser

The Dispenser is shown in the hands of Ernesto: An alarm is signifying that he needs to take a medicine (this is explained in the off-text). He reaches for the device and presses a button. (LeadingAge CAST, 2005, 4:05).

Stove-Control

We see as the stove is deactivated automatically. This is explained (overvoice) to be due to Ernesto forgetting to turn it off on his own (LeadingAge CAST, 2005, 4:57 – 5:02)



TV: Assessment-Tool

The TV with the implemented card game that is explained (overvoice) to help monitoring Ernesto's cognitive capabilities. (LeadingAge CAST, 2005, 7:30 – 7:32, 8:08-8:11)

(Tablet) Computers

(Tablet) Computers are the dominating devices. They appear throughout both videos. They are carried around by different actors and are referred to in side-gestures. (LeadingAge CAST, 2012, 2:31)

[31] They are everywhere – and the viewer encounters them already when Alma arrives at the hospital after her stroke and when Ernesto visits the doctor. Doctors and nurses carry them with them to refer to them occasionally. They appear when Alma is transferred to the rehabilitation center, and when Alma returns to her home a neat little tablet computer rests on her coffee table, ready to call the doctor. Ernesto's son checks on how his father is doing via the computer, and even when Ernesto celebrates his birthday, in the end of the video, a family member joins in on-screen. The physician Alma calls via – of course – her tablet, even has two of them.

1.2| Don't Paint the Elephant - Paint the Tablet Computer!

The (tablet) computers are performed as crucial to unlock the techno-future. Not in their material existence, but in what they contain and make accessible (and thus visible): Information. And the same, although portrayed in different types of computers[32], holds true for the 2005-videos. It is the (tablet) computer that facilitates the substance of the videos. In the end, showing computers does not mean that they are the key-technology that facilitates improvement in caring for elderlies. Rather they are the means to unveil a larger, invisible socio-technological world that comes together in what the tablet computers depict – what appears on the screens. A rather inconspicuous scene in the 2012's video may act as good case in point.

> Doctor Louise Rodriguez: "Alma's stroke has left her a weak on her right side and she's having difficulty walking."
> Doctor Louise Rodriguez (in-scene): "Again."
> Doctor Louise Rodriguez: "Because Alma's in a care network we had her entire electronic medical record when she arrived. We knew her conditions, medications and allergies. It helped pinpoint the right treatment for her stroke. We even knew what medication she took last and when from her medication adherence records. It probably saved her live. Our goal is a plan that gets Alma back to normal, living at home and avoiding a re-hospitalization."
> Doctor Louise Rodriguez (in-scene): "Here he is - he is David he is gonna get you set up with rehab" (LeadingAge Cast, 2012a, 02:34 – 03:08).

While Doctor Rodriguez explains Alma's condition and how technology provided the means for effective treatment, the depiction follows her examining Alma. In doing so, she occasionally refers to her tablet computer to retrieve information. In a brief moment, the audience gets to see what is on her computer. Portrayed are charts and graphs, general information on Alma and her medical history, but also more detailed information on her medication intake and further parameters that are considered important for providing the best possible treatment. Technology has – speaking with Rodriguez - "probably saved her life". But what kind? Although accessible through the (tablet) computer, it is not the little device deliberately placed in the hands of Rodriguez by CAST. There is something else that nobody dares to show explicitly, hidden behind (or rather: inside) this small computer. There is an elephant in the room, so why don't talk about it?

This elephant even has a name, it appears continuously throughout both video-corpora: The *care network*. Finally, we are getting closer to what is hidden inside the grayish little plate that is the tablet computer. It is made more explicit in the 2005 video:

> Ernesto's Grand-Dauther: "Well the caregiver network - its my mom, my dad, and I. And the doctor and his staff.
> (Music sets in, plays until the end)
> Nurse: "My part in that team is to be there to answer any questions I can. To give any kind of patient-teaching I can. And to train the family in caregiving. We rely on these people, because they are there with the patient a lot more then we are, they see things we don't. So its important for us to all work together. The caregiver network is two things. Its people supported by technology (LeadingAge CAST, 2005, 01:10 – 01:17)

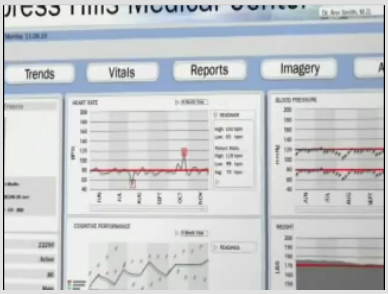
[32] Tablet Computers, although already existing as PDAs and a „Surfpad" brought to market by Simens, only saw their rise in 2010. It is in this context remarkable that they get shown in the 2005-videos already and make the videos a future-vision even more so, depicting technologies that could only be anticipated at that time.

Now what is this care network and how is it ought to safe Alma's life, as suggest in the sequence? The video, without detailing the technologies much, fosters an understanding on how they are supposed to "support people". And the (tablet) computer is the means to illustrate it. When following the description offered by Ernesto's daughter as well as by the nurse, the care network is constituted of an association of technologies and people caring for elderlies. What this means, especially in terms of care is the topic of the next chapter. Yet, here it is essential to focus on one key-part: the technological side of the care network.

Image 6 and 7: Computer Screens, Risks and Standardization

The Traffic-Light-System

To allow informal cargivers assessing the wellbeing of those they care for a traffic-light-symbolic is used. Here tracking the wellbeing is broken down in easily assassible categories that allow tracking of well-being over distance (Image: LeadingAge, 2005, 4:43)



Charts

Charts are dominating in articulating the medical and quantified assessment of well-being by experts. This not only grants a „science-like" depiction (charts appear difficutl to read, thus manly to be assessed by experts). It also highlights deviations as main concern: Tracking over time („trajectorification") becomes necessary, and the computation of wellbeing through quantification allows to identify deviations that reflect embodied risks. (Image: LeadingAge, 2005, 5:14).

The tablet computers act as an interface and crucial node bringing together different actors: They open up a window on quantitative extensions of elderlies. By doing so they establish a connection between elderlies and their caregivers: relatives as well as professionals (nurses, care staff, medical experts, etc.). Behind this image lurks the notion of a "technological fix", following Lisa Rosner (2013) that promises to facilitate efficiency and safety through the collection and calculation of large amounts of data. Quantitative extension of the elderlies' bodies is one key-aspect in establishing the technological fix and runs beneath the surface of the techno-futures: Not only assumes it that all parts of elderly identities relevant to care practices can be quantified and made measurable. It also positions this quantification as key in providing the means for "better" care. For doing so, CAST relies on specifying the problems articulated in their deficit framing of late life as to support this technological fix. Rather then showing how technologies "improve" the future, CAST is focused on framing and orchestrating its interpretations of the present as to support its visions in the first place. It seeks to establish the need for its fix. So, how is this achieved?

2| Visualizing Risks through Computer Screens: Quantification of Late Life

The representation of technology is to be understood first of all as matter of making visible what remains otherwise hidden: Metrical dimensions of the aged. Quantified extensions of identities connect coming into an old age with risks (that are commonly referred to as "age-related").

Where the videos tell a story of lacking capacities and fragile bodies in terms of the deficit model of late life, the depiction of technology builds on this model by connecting fragility with dimensions of the aged, only made visible by it. Elderly appear then to be in need of training and supervision in their medication intake, consequently they gain a medical history just as much as a social one. Their needs and (medical) *risks* get translated in numbers on exercise, how much they drink and sleep, or their movement-behavior. And these parameters get expressed in metrics: Hours of sleep; time, amount and type of medication taken; meters walked; hours exercised. The elderly gains this numeric extension of his- or herself that is then mainly referred to in medical terms of potential risks: Late Life is then to be referred primarily in terms of incorporated risk that demand calculation and management. In the following (**2.1**) I am going to explain how CAST frames AAL-technologies as necessary fix to an immanent problem (namely that of risky, elderly bodies).

Yet, as I will detail in (**2.2**), the visualization of embodied risks becomes only possible through introducing technologies that allow doing so. Accordingly, AAL-technologies not only provide a "fix", but also establish and specify the initial problem contained by the deficit-framing: It directly associates and attributes late life with immanent risks that need supervision and management.

2.1| Trajectorification: Framing aging as continuous and risky endeavor

In a deficit-framing of late life, aging is performed as an endeavor "to be worked on": as success never can be taken for granted. "Aging" is therefore bound to a terminology of "deficits" and "incapacities" that need to be "managed", "organized", "controlled" and "planned for". This notion is additionally emphasized with the introduction of embodied risks through their technological visualization.

In the videos a terminology of "trajectorified aging" is used regularly and already attuned for before introducing the technological fix. CAST establishes a notion of insecurity when staging late life. Which is then repaired by establishing technologies as "fix". Already before visualizing embodied risks, there is the constant subtle reminder of their existence: There are care- and treatment plans, exercise-schedules and training programs, medications and health records. Relatives of Ernesto and Alma have to make sure that medication is taken correctly and in-time, organize daily routines, schedules with doctors, and so on. By placing a strong emphasis on planning and organizing, age is not only constructed as a biological phase, but establishes the need for preserving states of health (mental and physiological) over time while loss and risks are immanent. Accordingly CAST rehearses its rhetoric of aging being a public concern: care-work

and issues around aging get constructed as such, especially in regard to health. This is already observed by Hazan:

> "The social discourse on ageing involves a vocabulary that combines moral order and practical needs: 'handling', 'managing', 'organizing', 'looking after', 'caring for', 'placing' and 'planning'. Within it old age is seen as posing a threat to everyday conceptions of space, time, and meaning. Furthermore, the competition among various social agents, such as welfare workers, politicians and the clergy, over the ownership and representation of this assumed social problem transforms it into an issue deemed to belong to the public sphere" (Hazan, 1994, 17).

Staging aging as to be constantly worked on places the notion of taking care of ones body onto the elderlies and their carers: It is maintenance that is strongly associated with aging and that regards both, bodies as well as social aspects. In this, aging – or rather: the imagined loss in life quality implied by the representation of gradually decreasing bodily functions - is something that one has to work actively against. This construction establishes a risk-discourse that associates aging with certain risks that must be prevented through active counter-actions, such as working out and staying active:

> Discourses around old age have mutated from one in which it was synonymous with poverty to one in which it was synonymous with dependency to one in which it is increasingly synonymous with risk. […] Policy and practice have also been consistently associated with the notion that there is a 'good' and a 'bad' way to age. This has shifted from a distinction between deserving and undeserving poor; bed blocker and older people being cared for in the bosom of their family, or community; and third versus fourth ager. We can thus see how old age 'is the product of particular types of relations of power binding those who govern with those who are governed' (Tulle and Mooney, 2000: 697); the complex interdependence between the productive and repressive aspects of such power is also evident throughout (Pickart, 2009, 81).

The notion of risk plays a central role in representations of aging. Alma is bound to loos her success. In the end, it all comes down to managing insufficiencies of aged persons – where technologies are presented as the only reliable tool to achieve "efficient" and "good" care (i.e. management of deficits and insufficiencies) and success in aging. The uncertainty-character of aging without technological assistance is key to showing that success in aging can only be temporal as long as it is not endorsed by technological mediation.

This becomes particularly visible with the case of Alma: After all, she is indeed successful in her aging without relying on technological intervention. Yet, this success is bound to be temporal and to be lost as the stroke occurs. Over the trajectory of the video, this "happy world" reveals itself to be a chimera, as evil lurks around the corner in its materialization as stroke. When lacking the *panoptical technological supervision*, everything can take a turn to the worst and the worlds of the elderly appear highly uncertain. In turn, technology is established as almost omnipotent savior as it defines risks that are calculable and thus become controllable (a notion that is very much in line with imaginaries of big data, as I will come back to later). As long as there is a lack of calculative objective means of technological supervision, aging is taking place in uncertain worlds, where risks remain unknown, unaccounted for and success on the line to its loss.

In this representation, aging without technological supervision makes risks incalculable (as they are invisible until they materialize as strokes, memory loss, diseases, injuries, social isolation,

etc.) and a matter of fate: if (rather: when) the stroke occurs and what happens next is beyond the individual's and its carers' control – and it's only "fortunate" that Alma's daughter is present at the moment fate struck. As the plot develops technology makes these risks calculable and accountable (and only through that visible). Yet, Alma has no such technologies that may intervene or even prevent. Ernesto is struggling, as technology has not stepped in yet. They only rely on their family as caregivers to intervene in the case of emergencies, a system that is presented as insecure, inefficient and highly uncertain. Yet, one thing is made clear in this representation: loss is unavoidable as aging is explicitly associated with diminishing health.

Lupton (1993) argues that the notion of risks dominating health discourses on aging (i.e. increased risks for certain age-related health-impairments) do not regard it as immediate medical issues but puts blame on those not preparing for the unavoidable. A similar case can be made here: Incidents like the stroke are framed as unavoidable effect of aging, but the consequences can be rendered more controllable with the aid of technologies. Therefore repercussions (here in the worst case death) are mitigated, and the process of ageing is slowed down.

Age becomes subjected to its trajectorification and future is framed as uncertain and vague. Accordingly technological interventions do not only achieve a quantification of biological aspects of elderly, but assess them in terms of future-risks that need to be calculated and prevented. Such a trajectorification is visualized in a number of instances where charts depict trajectories over time and make them accountable and projectable into the future. As such, care becomes not only an issue of maintaining bodies in their current states, but presents these bodies as also to be maintained in an future-perspective of decay. In such a performance, the future is either constructed as unknown (in the lack of visualizations of risks through technological devices) thus hindering counter-actions or accounted for (through the visualization of risks). Technologies are hence performed as making futures accountable and calculable.

2.2| Locating the Problem within the Body: Embodied Risks & the Deficit Model

Knowing embodied risks allows the trajectorification of aging in terms of decay. Simultaneously such a naturalized conception of risks that become part of the body feeds back into the deficit-conception of aging, where bodies become uncertain and risky themselves. The body, even if working properly in one moment, still bears the risk of falling apart at any time and over time. Even if success in aging is achieved, making risks visible places the body again under risks (of the future) and establish them as a concern. In such ways, the body, even if it is not dominating the elderlies' self at one point in time, becomes then again a matter of concern – even if they are momentarily proper working. In such ways, bodies are extended as a concern over time through the visualizations of risks.

Such a construction of risks then allows the rehearsal of the deficit logic and simultaneously shows how it feeds into the set-up of technologies. The location of risks within the body, directs action towards it and demands for technologies that visualize them. Simultaneously, complex

measures are necessary for identifying them and direct agency to those capable of reading these risks. The identity of the elderlies are shifted accordingly to beings of incorporated risks and their behavior must be adjusted in preventive terms. Terms such as "age related impairments" signify this and construct elderlies as different – namely more risky – then other age groups. And it places them under the scrutiny of supervision and surveillance. The construction of risks and their internalization rehears the deficit model and justify its inscription into the implemented technologies of CAST's future vision. They also constitute as social ordering and position elderlies within a relationship of surveillance and objectification in such terms.

These technologies are at the core of co- and re-producing social and knowledge orders by making specific notions of risk quantifiable and visible thus reinforcing the logic of these risk being manageable or controllable: Just as much as they rely on a deficit conception of late life that facilitates a perspective on elderlies as being at risk, they themselves re-produce these risks and thus the conception of the "risky elderly" through their means of making risks visible in the first place. The location of risks within the body has strong normative implications on the social positioning of elderlies, but also on how care is to be organized as a social system the technologies are embedded in, namely directed towards care of bodies (at risk). The framing of AAL-technologies (as solution to a specific problem) turns out to be machinery for constituting, facilitating and shaping the present in problematic terms, in the first place: It problematizes late life in deficit terms, establishes elderlies as bearing immanent and incorporated risk, and achieves a trajectorification of late life that demands constant technological supervision – thus again establishing the need for their technological fix. It is the technological fix that demands itself, by explicating the problem it seeks to resolve.

2.3| The Technological Fix: Achieving Autonomy by Disconnecting Bodies from Beings

If this is taken into account, how does CAST frame establish its technological fix as such in the first place? This is achieved by establishing a win-win-win situation (as also identified by Neven, 2011) that hovers around the promise of *autonomy* (which after all mainly means that elderly are kept outside the medical system generating costs[33]). Just as the medical system faces a win-situation through more cost-effective treatment by keeping elderly "out of the system", elderly gain a win if one accepts the well-rehearsed autonomy-discourse where elderly are constantly shown to have a high priority to stay at their homes as long as possible. Here the quantification of the medical body gains a new dimension that can be easily excluded from the elderlies self as it becomes a pure concern for medical experts: Charts, Graphs, Numbers, Tables, Metrics… - they are the domain of the expert who can read (and thus see).

[33] and inside a consumer system that generates profit for companies

Establishing the first "win": Autonomy of elderlies

Accordingly, these interfaces are placed in the capable hands of doctors and nurses, which are constructed as having the agency to read, interpret and analyze the data. Only when being able to come to the correct conclusions based on the skilled interpretation of data, one can make decisions and manage the risks. The heavy weight on managing age is placed in the hand of the medical expert – and does not rest on the shoulders of the elderly anymore. The holy grail of eldercare – autonomy - is to be achieved accordingly: What hinders the elderly to live autonomously is the concern with incapable bodies. The delegation of this concerns is ought to free elderlies from these concerns and responsibilities, allowing them to re-focus on their lives. Alma is moving freely, Ernesto is celebrating his birthday, both gain agency over their lives, as others – namely experts – *take care* of their virtualized[34] and quantified bodies. Finally, CAST explicates the solution to all the problems it confronts the audience with in its deficit framing of late life. As soon as their bodies become virtual, Alma and Ernesto are able to (re-)gain autonomy in the sense of non-concerns with insufficiencies and incapability.

Kavanagh and Broom address these issues of managing embodied risks (in distinction to environmental and lifestyle risks) in their consequences for the self. They argue:

> "With corporeal risk a part of one's body poses a threat to the self resulting in a dissociation between body and self. [...]. In the case of abnormal Pap smears, corporeal risk is managed by surveillance and sometimes removal of the dangerous part which is cast as separate, "other" from the threatened self. [...] Through diagnosis, this woman came to experience her own body as potentially dangerous - as liable to destroy her. She clearly separated her self from her body. Her body could be dissected, hazardous parts identified and removed, while the self remained no longer under threat from the body. One could ask: who is this person, essential self, from which bodily parts can be removed, if she is not her body?" (Kavanagh & Broom, 1998, 442).

To illustrate how this disconnection "frees" the elderly, let me turn to one sequence in the 2012-videos: After arriving back home from treatment, Alma is sitting down with her daughter to call her doctor (via her tablet computer). On the other end of the line sits the doctor in his office. Two computers are placed in front of him, one showing Alma and her daughter, the other depicting charts and graphs: the quantified aspects of Alma. And indeed, some numbers raise concern: Alma is not sleeping enough. She is having pain interrupting her sleep. Medication should take care of it, the doctor decides and prescribes (technologically assisted) the fitting pills. Taken care of her medical self, Alma now is free to take other things into her own hands - Living her life:

> Alma: "That sounds great! There is one other thing bothering me and I - I just wanna say it. I - I hate relying on Susan so much. I keep telling her to take this vacation she's been planning.
> Daughter: "Mo-om!"
> Doctor Liam (family doctor): "You know, Susan, you should go on that vacation. You can log-in remotely to check in with your Mom as many times as you like. And the home care agency will be there for her.
> Daughter: "Well doctor I think I will take you up on that."
> Alma "hmhmhmhm (silent laughter)." (LeadingAge Cast, 2012a, 05:31 – 06:00)

[34] "Virtualized", as their physical bodies get disconnected from their medical parameters through their quantification.

This instance is a good example for how delegation of bodily concerns (the doctor will keep track of ones virtual, quantified aging body and intervene if something is not quite all right) is ought to free the elderly: Alma, as soon as her body becomes a non-concern, is able to think of her family and caregivers – and even send them away on their vacation: Alma is finally not dependent on informal care anymore, as technology takes over.

In the videos uncertainties of aging remain vague as long as they lack technologies in their aging. Only when they step in, uncertainties become (accountable, measurable and thus manageable) risks that are associated with quantified aspects of the body and put under supervision and control of devices and their operators (medical experts). In this representation, elderly gain properties of those shown to be young: they make lifestyle choices, follow their wishes and are presented as actively shaping their lives: They turn into older-looking versions of their young counter-part-characters in the videos (children, friends, etc.). This is only possible through the delegation of concern and control over bodily aspects that get connected to diminishing parts of what aging entails. The technologized elderly experiences an extension of his/her body through quantification, yet this extension is transferred to professional carers that gain agency over caring for elderlies bodies: As aspects of the body are quantified they become tangible over the distance through the translation into numbers: The body becomes virtual and care is not reliant on the physical presence of the body. Ultimately, AAL-technologies are established as the technological fix to the problems that fragile, deficit bodies entail in their incorporated risks – resolving the very problem that is only created by the technological means for visualizing risks.

The autonomy-discourse shows to establish the "win" for the elderlies themselves. Here technologies get constructed as providing the means for a better management for the medical aspects of the self that ultimately results in the delegation of concerns to medical experts.

Establishing the second "win": The technological mediator and the authority of the expert

Yet this rhetoric could easily backfire as medical experts won't be all too happy to be responsible for their clients well-being outside office hours. This concern is often raised by medical experts confronted with AAL and is one major argument in the criticism coming from care and health professionals, next to the fear of replacement (cp. Bachinger & Fuchs, 2013, 82). Here again the technology offers a solution, as the obligations of care are not directly delegated to the medical professionals themselves, but rather first end up in the invisible algorithm of the system that only involves human judges of information in case thresholds are exceeded. This is visualized in various ways. One is to show the interface offered through the tablet computers as to be simple and easily accessible - even for lays. In the 2005 videos a simple coloring-system signifies where potential problems demand intervention (red and orange dots) or if everything is ok (green dots), displayed as "member status". As for the 2012-videos the system "red-flags" Almas doctor when prescribing a medication that does not comply with other prescribed drugs: Here the medical

expert is shown to not having extra work to fulfill but rather gaining the convenience of the system checking Alma's medical records automatically.

The virtualization of the body is a key vehicle for establishing this win for the expert: On the one hand it introduces technology to assist in professional care. And it assigns additional authority and agency to the experts: The visualization of risks in the quantification and trajecorification of late life allows intervention from afar. Interventions do not rely on physically present bodies anymore – and this is achieved through two means: Interventions through human and non-human agents of care. Technologies allow the access to virtualized bodies – and we accordingly see repeatedly how particularly medical experts are able to refer to elderlies bodies and trigger interventions over distance. One such example is the intervention of the medical doctor via telehealth appointments, where the expert is able to refer to and examine the bodies of patients without their physical presence. Although they appear in charts on a tablet computer, the quantified depictions represent the body and behavior of Alma and Ernesto: They are representations of bodies despite their absence, making them virtual bodies. As these bodies become virtual abstractions, they do not rely on physical presences. Rather they rely on technological interfaces making them visible and accessible. Here agency over the elderlies' bodies is delegated as numeric information is transferred. Only who is capable to see and read this information is able to take action upon these bodies. As soon as a problem materializes into a concrete phenomenon expressed in metrics and thresholds it becomes manageable through "outside agents" (doctors or relatives, for example) – and thus disconnected from the self.

Technological intervention constitutes the transfer of agency over bodies from elderlies themselves to medical experts who are capable to read the information provided by the devices. As risks become visible and manageable through technological devices, access to their information is mandatory to carry out efficient care. With the introduction of technologies, care is delegated first to technologies: They intervene and control the elderlies (bodily) wellbeing and remind them to take care of their bodies: To take their medication, for example. Furthermore, technologies collect data on elderlies and order and process them. They assemble quantified information on elderlies in trajectories of sleep, exercise, and other parameters and communicate this information to doctors and nurses, highlight deviations, and cross-reverence patient histories with new prescriptions. In this, technologies have a strong ordering-power, building on inscribed norms expressed in thresholds and in definition of which parameters of elderlies to be measured.

Finally, medical experts gain agency over elderlies bodies through the information facilitated by the technological devices and intervene primarily in cases of deviations of normal-values. Two central things become visible here: First, the shift of agency to the doctors and from the elderlies. It is not necessary to check back for how elderlies are doing, but rather the technologies provide all the information - and do so more reliable. Focused action then becomes possible, be it on administering the correct medication, coming to the right medical treatment in emergencies, or for the supervision and set-up of exercises and therapy plans.

Establishing the third "win": Freeing the caregivers

The third "win" is established on the relative carers' side through a multiplicity of dimensions that all depict caring as becoming easier and more convenient through the implementation of technologies. It is put into a nutshell in the 2012's video:

> Doctor L.: You know, Susan, you should go on that vacation. You can log-in remotely to check in with your mom as many time as you like. And the home care agency will be there for her (LeadingAge CAST, 2012a, 5:40-6:00)

Caring over distance is here again an important theme, also in the earlier video on Ernesto:

> Son: Well, the house is networked with sensors all around so it gives us a real good picture of what's happening in the house.
> Daughter-in-law: We don't have to be close by to see it. We can be anywhere. Ernesto has to give us permission - he's allowing us to go in there (LeadingAge CAST, 2005, 1:43)

Here autonomy is a key rhetoric device in establishing the triple-win. Yet, autonomy has to be constructed as a central wish for all involved parties: In the case of elderlies this means that staying at home is a top-priority of them – and is repeatedly rehearsed as a dominating wish throughout the videos. Constituting this wish successfully then provides the means for establishing the "win" for the other parties: relieving the care and medical system from its pressure, as elderlies are kept out of it as long as possible; lowering the burden of caring is achieved simultaneously through automated technologies that are put in place at the elderlies' homes. And doctors, medical experts and care professionals gain resources for treatment, as elderlies can "act autonomous", too. Here, though, autonomy is depicted in a strictly one-dimensional way, meaning living at home and without the necessity of others to intervene and assist. Caring is carried out by technologies, mostly, although the depiction of human-human-interactions dominates the videos, and becomes a matter of non-concern.

3| Conclusions: Relating the technological fix to the deficit model

So what is this data about and how is it spoken about? First of all turn to what is measured. In both videos medical parameters take up a large part of the acquired data: Sleep patterns, blood sugar levels, exercise-intensity, medication-intake, and so on. Beyond that more general data is gathered that are situated on a larger behavioral side: Movement patterns within the homes, social contacts, or when the person eats. Additional data comes from medical histories, prescriptions, and also social preferences (e.g. the system "knows" that Alma likes to work in her garden, so a room with garden-view is assigned to her when she arrives at her care facility to take part in a therapy program). By doing so, Alma's quantified self is one of mainly medical concerns: "Doing well" does not encompass her own assessment of her life, but rather defines well-being as a purely medical category. This becomes also visible in the final assessment of Alma's status in the 2012 videos.

Alma, sitting at the sofa in front of a tablet computer, together with her daughter. She is having a videoconference with her doctor, Doctor Liam.
In the same scene, camera jumps forth and back, showing Alma and her Daughter talking to the tablet where Doctor Liam appears on the screen and to Doctor Liam, showing a tablet where one sees Alma and her daughter on the screen. Next to Liam's tablet stands another tablet computer where medical data on Alma (sleep patterns, information about her prescriptions and treatment) appear.

Doctor Liam "Hi Alma, hallo Susan. How are you feeling Alma?"
Alma: "I am happy to be home. But I am a little tired. And my arthritis is - is acting up and I – it's keeping me awake - can we try Naproxen for it?
Doctor Liam: "Yes I see from your monitoring data that your sleep has been disrupted. I wish could give you the Naproxen for your arthritis but I see here they started you on a blood-thinner in the hospital. Unfortunately blood-thinners and Naproxen are a dangerous combination. The system red-flagged me when I entered the prescription. Also - I like to start you a more physical therapy. Your home health agency transferred over your motion data from your home monitor and you should be moving a lot more then you are" (LeadingAge Cast, 2012a, 04:47 – 05:31).

Here quantification is shown to provide more efficient – and in the end also safer – care to Alma: The system "red-flagged" doctor Liam when he wanted to prescribe Naproxen: The data shows to know more then Liam does, as it has the "whole medical history" at hand. Even doctors are more reliant when technologically assisted. Furthermore, when Doctor Liam is asking Alma on how she is doing, the answer is a mainly medical one.

The deficit model feeds strongly into how technologies get imagined: Elderlies have a structured everyday life, they prefer living at their own home ("I am happy to be home") and their well-being is referred to in mainly medical terms. Just as the representation of elderlies builds on bodily incapacities and fragility that get associated with medical value-judgments, the technology rehearses this medical view of fragile bodies in its setup, as it is concerned with such parameters.

The representation of technologies not only re-produces the deficit-imaginary of the fragile elderlies, it also emerges from such a notion of aging. Only in such ways the necessity of technologies becomes established. In the end technology relies on elderlies being fragile – and even if they are not, they are shown to be on the edge of becoming it, demanding for constant technological supervision in order to prevent deteriorating health (or at least make it manageable). Characterizing elderlies as fragile makes caring for elderly an exhausting task, as constant surveillance becomes necessary. Ernesto is in constant danger of leaving his stove on. Alma could suffer from a stroke at any time. Both find it difficult and exhausting for their bodies to buy groceries. In this caring is an overwhelming job. And only when caring is framed in such ways, technologically assistance turns out to be a welcomed alternative.

The disconnection of medical bodies from the identity is the necessary means for achieving this construction: Only as it gets externalized and expressed in metrics, interventions become possible and transferred into the domain of (professional) carers. This externalization is achieved through the technological setup that allows addressing medical concerns through numeric expressions – and thus without relying on the elderlies' physical presence. This shifts the agency over medical bodies from elderlies themselves to those in charge of caring. Presenting caring as a wider social concern is the dominating view that gets established through the fragility notion and becomes

manageable through the externalization of certain properties in the process of quantification. Yet, while aging bodies as a societal concern are addressed in terms of economic distress (rising health care costs, for example), the technological intervention marks the solution to the problem: Technology is taking care, human carers just communicate the (presented as obvious) inferences from the data and act accordingly. This also implies that data must not appear ambivalent: Judgments and inferences drawing on them are always straight forward and solid, quite different to information provided by elderlies themselves: Alma is asking for Naproxen, but the data speaks against her wish: preventing negative consequences of wrong prescriptions. At this point, elderlies show not to be able to make clear judgments over their own wellbeing and data always will overrule them.

The construction of the technology as a window to the risky aspects of elderlies, positions it as central means for improving care, where improvement is defined by medical parameters associated with risks. Without technological interfaces, medical experts just as much as informal carers and the elderlies themselves remain blind in respect to potential risks and aging becomes a highly uncertain. Accordingly, technologies are framed as social glue holding together the care network, as everything revolves around it. With Callon, the technology presents itself as obligatory passage point and is positioned as such narratively in the videos: The rhetoric frames care (1) as a matter of identifying risks, (2) making these risks visible, which is only possible through the introduction and implementation of new technologies, and (3) aligns the different actors accordingly to show a triple-win.

With the implementation of new technologies in care settings, referred to as the care network, the identities of the different actors constituting this network are aligned accordingly to show this proposed solution to be working for everyone. How these identities are constructed will be the topic of the following chapter.

CAST, in establishing this techno-future of its care-network, follows a strong political agenda that is built upon medical norms and values and neoliberal logics of responsibility, activeness, cost-reduction and efficiency. This political agenda is then built into the technologies depicted in the videos, as they manifest the social norms and values through the definition of thresholds, establishment of parameters to be measured and the ways data is interpret and the conclusions that are drawn from it. Through these means, a societal problem gets established in the technological setup that is ought to resolve it.

Chapter 9

CARING FOR QUANTIFIED AND DEFICIT BODIES

In this chapter I will relate the previous discussions on representations of late life and AAL-technologies to care in its organizational dimensions and as practice. ***Sub-Chapter 1*** *provides a brief discussion of how care is discussed in social sciences, providing a connectional framing for this chapter.*

In ***sub-chapter 2*** *I am going to discuss how CAST stages care, relating back to the problematization of the present as a necessary means for facilitating a future-fix. Here* ***chapter 2.1*** *sheds light on how CAST frames present modes of care (the "traditional care framework") in problematic terms, showing its incapacities and inefficiencies. I therefore highlight key characteristics of this negative framing of the present states of care. Afterwards I will discuss in* ***2.2*** *how the technological fix of AAL establishes a positive framing of improved care-futures.*

Sub-chapter 3 *then discusses the re-assignment of agency over bodies, as achieved through the introduction of the technological fix and how this transforms care. Here I also discuss imaginations of "the user" as a compliant (to technologies) are inscribed in the technological fix and thus are a necessary pre-requisite for its proper working.*

The ***concluding sub-chapter 3*** *then brings the loose lines together and discusses the previous outlines of the chapter in relation to the deficit model of late life, underscoring its relevance for the establishment of the technological fix.*

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1| Conceptualizing Care

Care, as Mol et al. introduce their collection "Care in Practice", for a long time was a privatized practice and of non-concern for wider publics: "[C]are figured in academia as a more or less tedious practical necessity, rather than as an intellectually interesting topic. Or worse: care hardly figured at all" (Mol et al., 2010, 7).

This changed recently and, coming from gerontology and nursing theory, it was taken up by a plurality of academic fields. Sociology began to occupy itself with care as practice, extending its interest into age and aging beyond its perception as a mere demographic variable. Care has become a the topic for sociology of work, for anthropology and the social sciences more generally. And since discourses on "graying societies", "demographic change" and the "care crises" were taken up by science as well as in media, and care also has become a growing concern for policy makers. Relevant questions were raised, concerning how care work is or should be organized, how

changing demographics impact care practices and the systemic organization of care in institutional and informal settings, or how to conceptualize care and its recipients. Quite often scientific discourses on care, care work and its recipients took the turn of ideological discourses, where different actors speak in favor of certain conceptions (and also mis-conceptions) of what care entails as a practice for those who carry out care work and its recipients. Domestic labor was – in a terminology of good care-work carried out by mothers – favored and confronted with professional (medical) care work. Feminist studies took up this notion to criticize the marginalized position as those mainly providing care in informal as well as formal settings. Recipients of care were described as patients, costumers, users or citizens, all implying different social positions and power-relationships (cp. Ibid., 7f).

Winance (2010) identified two central approaches for conceptualizing care, both being mainly established via agency that is attributed to those care is targeted at: In the first, the medical model of care, action is focused "on the individual to be 'rehabilitated' (Winance, 2010, 93). Disability, and more generally the need of and for care, is located in pathological bodies in a functional causality of insufficient bodies that affect both, the individual's identity as well as their social status. On the other side of the spectrum Winance locates the "social model" that describes disability as "the result of social causality", both constituting a "position of dependence and passivity" of the – accordingly called – recipients of care. In such a perspective those in need for care are presented at social margins, either due to their bodies that functionally cause their marginalization, or due to society itself that (simply put) has no adequate position for those in need of care. For the letter model the set-up of buildings and stairs is an often-mobilized example that "blames" society for not taking persons depending on wheelchairs into account when planning and building their houses (cp. Ibid.).

In both perspectives care remains one-directional. There is someone - the caregiver or provider – that offers services to those "unfit" for/in society in order to adjust either their bodies (or society, depending on the perspective) to re-integrate them. Whilst the caregivers actively offer their services, their target is the passive care-recipient. Whilst the one side does all the work, the other "just" receives what is offered them as help. Although the social model acknowledges a more active role ("the people committed to this movement fight for the ability to control their lives and to decide for themselves what they need" (Ibid.)) it still relies on terms such as "help", "support" or "personal assistance", where the incapacity is put to blame and correction/normalization of those subjected to care is required. Here the term "care-*costumers"* frames a positioning of power in terms of choice for the service. As Winance summarizes:

> "[W]hilst Disability Studies and ethics of care researchers have different conceptions of the person [...], they both base themselves on the same conception of care in terms of a relationship of aid going from one person, a carer, to another, the cared for; the former – active – helps and supports the latter – passive" (Ibid., 95).

Yet, there are new strands of debate that depart from this unidirectional logic of power-relationship and stress a more active role of those being cared for: One where care is a mutual

relationship of caring and dependencies. Winance herself "offer[s] a conception of care in terms of shared work, dispersed in a collective of humans and non-humans, each person in the collective being simultaneously an object and a subject of care" (Ibid.).

In all these approaches care is conceptualized in terms of a relationship between carers and those being cared for in different nuances. Adjustments, be it of bodies or societies, takes an important position in this conceptualization, putting blame to incapacities to either one site. Still, incapacity and its adjustment remains an important subject in care work and can be found in most attempts for conceptualization. What rather gets negotiated are relationships of those involved in caring and its impact on the organization of care, as also Mol points out (Mol, 2008).

When turning to the constructions and imaginations of care, as embodied in CAST's videos, these questions become relevant. How is care conceptualized in these visions as a practice that involves different actors, standing in certain relationships to each other that shape and constitute this practice as much as their own identities (as e.g. carers and recipients of care with their specific capacities to act), and operating in certain institutional and organizational settings?

I also ask for the relations, the practices and the organization of care that give this term its meaning. In the following I will carve out how care is imagined and performed in the present as well as in the future. Accordingly, I will come back to conceptualizations of aging and elderlies, as well as of technologies, as both get depicted within care settings. This will be the final part of the puzzle that is CAST's future. Following this brief outline, I will address questions raised in the discussed contributions: Questions for how CAST imagines in the videos the relationships of care, ideals and normal values of care, and the power-relationships and assignment of agency.

2| Performances of "Good" and "Bad" Care

I already established the performance of late life in terms of a deficit model and how this ideology gets rehearsed in the set-up and implementation of technologies, where particularly adjustments of bodily concerns become a crucial hinge for intervention. Following this logic, the deficit framing of age infringes on how care is imagined by CAST to be orchestrated and organized.

The relevance for the deficit model in understanding CAST's "logic of care" (cp. Mol, 2008) can be illustrated by turning to this fundamental question. Mol addresses what constitutes care as an quite specific form of interaction more fundamentally and also quite idealistic (which is all but an accusation, in my opinion), and gets quite profoundly formulated in this passage:

> "The ideal of good care is silently incorporated in practices and does not speak for itself. Given that it is under threat, it is time to put it into words. That is what I set out to do here. In this book I talk about the treatment of, and life with, diabetes, while seeking words that allow me to do so. The aim is to articulate the specificities of good care so that we may talk about it" (Mol, 2008, 2).

Mol does not to provide a definite answer, as STS generally is self-reliantly avoiding. Rather she asks herself (and the reader) how and to what ends the notion of "good" in care gets established and how this hints at what may be "the logic" of care. Thus the title of this first part of my chapter

on care: “Goodness” is a fundamental notion, or property, that marks something as wishful and desirable, whilst suggesting also the existence of its counterpart, of what is “bad” care. So what is it, that gets framed as being “good” in care, and what does it tell us about the fundamental logic of care as applied by CAST?

It is the concern over bodies, firstly (and that of its deficits more generally) that is placed at the heart of CAST’s notion of care. One hint comes from how technology is built around the bodily-deficit logic: Above I described how the directional shift towards the body and its quantification provides the means and capacities for improved caring for elderlies bodily existences. I argued that the lack of technologies positions elderlies and particularly their bodies in an highly unreliable and uncertain state, as their embodied and incorporated risks remain invisible and thus unaccountable. Technologies are means of prevention and control, not relying on distance (or rather closeness) and physical presences of medical bodies.

Applying this to the logic of care, the impression may be that it is about treatments of bodies and caring for them. Yet, this does not capture the whole picture: It rather is about caring for physical presences in deficit. And it is about interventions that prompt adjustments and normalizations of these deficit-beings. Some examples should help to clarify.

Image 8: In the 2005 videos we follow Ernesto and his family through their daily life, as they struggle with care as an exhausting task to accomplish that affects all members of the family. Already in its introduction we are confronted with descriptions of caring for Ernesto.

> Son: I mean, he was the guy who was always there. He was the one who was always trying to help people. And now he's the one who needs help. We asked him to move in with us – Nooo.
> Ernesto: I mean why? This is my home. I don't wanna live in this place I don't wanna bother them. They have their own life to live.
> Son: So we find ourselves an hour away from dad. It is that which creates a problem. And in the same time we find that he needs our support, needs our help.
> Grand-Daughter: Gosh, there is so much to think about and we have to know if he is - you know – eating, drinking, moving around, can pay his bills on time..., make sure he's taking all his medicine. (LeadingAge CAST, 2005, 0:15- 0:36)

We learn a number of things about care in this short sequence of the video. First of all, elderlies and caring for them is presented in terms of an exhausting, challenging and overwhelming task to accomplish. Here Ernesto is first framed as being in the need for care (“He was the one who was always trying to help people. And now he’s the one who needs help”) and simultaneously is performed as becoming a burden for his family through this need.

The deficit model of late life supports framing care as practice of adjustments and normalization. This is further facilitated in the performance of care is the videos. In the quoted sequence care appears to be directed at compensating Ernesto’s deficits that get situated in mental (in-) capacities to care for his body on his own. As one is not able to maintain their bodies, age becomes problematic beyond the initial bodily deterioration in making care necessary. Accordingly care is rather a matter of agency, then of something that only comes into existence under certain circumstances.

Care, in this perspective, is the care (in terms of "taking care of") of bodies and aims at maintaining a persons' ability to participate in society as emancipated, autonomous and active member. This facilitates a quasi-medical understanding of care aiming at treatments of pathological bodies. The need for care is rooted in fragile bodies – and their deterioration is functionally linked to aging. Care is synonymous for caring for bodies mainly, and only further on with those inhabiting[35] them.

This is facilitated in a number of instances where concerns of aging are rooted in the deficit bodies that are not taken care of adequately anymore - be it the concern for medication intake or adequate exercise. When we encounter instances of care in the films, we are accordingly confronted with exercises of adjustment and maintenance on bodies: The doctor that highlights the need to exercise more and the implementation of the medical dispenser are two such examples, where care is carried out either by humans or technologies as tasks of body-maintenance. This becomes tangible in Alma's doctor describing her care plan:

> Doctor: "The physical therapy regimen will have her home soon. Once she's there her care plan consists of three components. One, telehealth: Almas doctors will be able to monitor her remotely. Two, in home sensors: to detect if she's declining or needs assistance. And three, a sleep monitor. This really helps us detect problems early. Oh, in addition Alma will have a personal emergency response system that can automatically detect falls. These systems help alert her caregivers right away. This really is the future of aging" (LeadingAge CAST, 2012a, 4:35-4:43)

These devices, described in the sequence, are focused on surveilling Alma's status and are concerned with her body. Yet, only the decreasing ability for caring for her own body constitutes the necessity of this technological intervention. Care is presented as the need for maintaining bodies and the assignment of agency to do so adequately. Through the establishment of such an insufficiency of the elderlies, agency over their bodies is withdrawn: This is a crucial element in the representations of elderlies entering a second childhood, as described by Hockey and James:

> "Deriving from particularized conceptions of children and childhood, these work to sustain a whole range of cultural stereotypes of aging as 'second childhood'. Images of physical decline and social marginality are invoked and, whilst rarely having 'validity as accounts of how people see themselves', none the less act as powerful symbolic markers of identity which are used to attribute characteristics to others (Cohen, 1986:13). Thus, as discussed below, the apparent 'limitations' of childhood are mapped on to a parallel series of 'inadequacies' believed to characterize old age. Within stereotypical images of old age as 'childlike' are embedded, therefore, the metaphoric strategies which create social distances between the worlds of adulthood and old age. By linking old age with childhood, the hegemony of adulthood remains unchallenged" (Hockey & James, 135).

The construction of incapacities to care for one's own body, due to cognitive and/or physiological erosion, is then a means to a) facilitate the need of care; b) locate the intervention of care at the body in terms of normalization; c) re-distributes agencies over bodies through the assignment of care-tasks to others then the elderly; and d) establishes the need by the withdrawal of agency from those with identities of being elderlies in decline, a move that is embedded in an hegemonic

[35] "Inhabiting" actually is a well-chosen reference, in this respect, as bodily deficits are staged as dominating identities, leading to a reduciton of identities to bodily concerns later-on.

discourse of the deficit model of late life, following the elaborations on second childhood, as quoted above.

2.1| Traditional modes of caring: The "bad" way of assistance

In terms of care both videos present a different focus on the depiction of care: Whereas in the 2005 video it rests on informal care, the later videos put a stronger notion on medical, institutional caring. Yet, also the 2012 videos problematize informal care as being the standard mode through which care is provided. This focus seems suggestive given the overall organizational set-up of the US care system at a large (cp. Chapter 6).

One passage quoted above may illustrate how informal care is staged in the case of Ernesto.

> Son: I mean, he was the guy who was always there. He was the one who was always trying to help people. And now he's the one who needs help. We asked him to move in with us – Nooo.
> Ernesto: I mean why? This is my home. I don't wanna live in this place I don't wanna bother them. They have their own life to live.
> Son: So we find ourselves an hour away from dad. It is that which creates a problem. And in the same time we find that he needs our support, needs our help.
> Grand-Daughter: Gosh, there is so much to think about and we have to know if he is - you know – eating, drinking, moving around, can pay his bills on time..., make sure he's taking all his medicine. (LeadingAge CAST, 2005)

I pointed to the framing of Ernesto becoming a burden. Two reasons constitute this impression: First, his persistence in wanting to stay at his own home. Distance becomes an issue for caring and ensuring its quality. Person-to-person interactions are framed as necessary for keeping up with how Ernesto is doing as well as for making sure changes in his status are identified early-on. The wish for autonomy has been discussed earlier and is presented as a crucial in this case too: In a) his wish for not "bothering" his relatives by moving in with them, and b) in the status of the own home within the value system. It simultaneously re-hearses the notion of becoming a burden for others: "They have their own life to live" (contrasting autonomy with being a burden).

The second aspect is the multiple means for re-assuring Ernesto's wellbeing that already were associated with bodily dimensions of aging earlier in this contribution. Here the mere maintenance of good health becomes an overwhelming task: Keeping track of medication intake, nutrition, and exercise make up a large part of care-work. Beyond this, more mundane aspects of life become challenging too: paying bills on time and risks such as cutting oneself while cooking, forgetting to leave the stove turned on, or moving around and falling.

"Bad" care = inefficient

The quoted sequence sets the tune for how traditional care is staged, and the negative tone attached to its representation. Care work is carried out by family members in informal settings, who help in "keeping track" of Ernesto's life. Care is performed as a burden for caregivers, especially in backdrop of informal carers own life, where care is not their main profession:

> Ernesto: "They have their own life to live. They are very busy, the kids are in a school, they have their own business."
> Son: "We have these - two nurseries that we are dealing with.
> Daughter-in-law: "And we barely have time during the weekday to see Ernesto 'cause we are so busy" (LeadingAge CAST, 2005, 0:30-0:36).

It becomes an exhausting and overwhelming task that is carried out by informal caregivers, where institutional support can only be provided as an additional support system, yet not as the primary provider of care services. This has to be understood in the backdrop of the US-American medical system that is highly diversified and expensive with governmental financial support hard to come by – thus making informal care still the primary mode of providing care (cp. Chapter 6).

Traditional care is staged similarly in Alma's case, although with other means for constituting this impression: Here care is also depicted as provided mainly through her family. Yet, the medical system gets more explicitly referred to as granting access to care services. This is embedded in a different narrative set-up, where Alma suffers from an explicitly medical condition – a stroke – that needs intervention through professional care institutions: i.e. hospitals and rehabilitation centers. Here, (home-)care is less explicitly problematized, particularly in the beginning of the video and until the stroke occurs. What gets described is the medical treatment of bodies, as Alma runs through various care institutions that aim at bringing her "back to normal". By developing this narrative, eldercare beyond medical treatment gets introduced more gradually, as the needs for supervision of Alma's aging become urgent only as the film progresses. Yet, care becomes characterized nonetheless. What is perceived as traditional, inefficient and to-be improved care is characterized in contrast to new, modern mode of caring.

In these references to traditional modes of care, Alma gains the function of an narrative agent for associations: Throughout the videos she refers to the "old days" when Alma was a nurse and professionally engaged in providing care work herself. As such, she is the main facilitator for what is to be perceived as a negative, outdated version of care. This allows positioning the care that Alma describes in her statements as outmoded and obsolete, as two sequences may illustrate:

Example 1:

> Alma: "When I was a home health nurse we used to see patients for a 30 minutes session and then they were on their own. Or sent to a nursing home. But look at me. I making my own coffee in my own kitchen" (LeadingAge CAST, 2012a, 01:39-01:42)

Example 2:

> Alma "ooh that's so nice - you all move fast - back in my day a patient would show up with a six-inch-thick folder in their lab and it would not be dill then that rehab people could start their work" (LeadingAge CAST, 2012a, 03:38-03:42)

These sequences are but two examples for how care is presented in Alma's case as problematic and outdated and not able to compete with its modern version promoted in CAST's future-vision. The notion that runs through these representations is one of inefficiency, as it becomes explicated in the introductory on-screen-text that start-off the 2012-videos:

> On-Screen Text: "Older Americans receive POORLY coordinated care. Health professionals communicate inefficiently creating REDUNDANCY and ERRORS. Our country spends TRILLIONS OF DOLLARS to receive sub-par quality and disjointed care" (LeadingAge CAST, 2012a).

This notion is repeatedly used and established and addresses both, inefficiencies in care systems on a structural level as well as its translation to the individual cases of Alma and Ernesto as representations of how this impacts individuals' situations.

"Bad" Care = Overwhelming/A Burden

Care gets shown to be carried out by informal caregivers that "have their own life", as Ernesto coins it. This means, that care is delivered by family members to their relatives besides their own tasks, framing it as challenge, and is depicted as a task that is consuming the caregivers life.

This negative framing is rooted in the variety and complexity of tasks caregivers fulfill in traditional care. Traditional care is provided through informal care members, primarily: Ernestos' immediate relatives are caring for him. The same holds true for Alma: "We are four generations strong", she says and explains how her family acts as primary caregiver. Their caring for Alma is carried out in a number of tasks, as shown in the videos: Buying groceries is a repeating image of this care-work in both videos, where the carers bring groceries to their relatives. Beyond that, care in its visual performance is focused on nuanced assistances of movements of bodies, where it is shown how Alma and Ernesto are lifted up from chairs or stabilized in walking.

Beyond that, care is described verbally: In these accounts, caregivers describe care-work in a variety of tasks to be fulfilled. We encountered them in previous statements and they are concerned with maintenance of the body through tracking medication administration, nutrition and similar tasks. There are also many other tasks the caregivers fulfill, such as managing payments, managing "all the paperwork" that comes with dealing with nursery homes and doctors; and overall making sure that the elderlies are comfortable. These tasks get merely described, are excluded from visualization and only mentioned briefly. Yet they take an important part in establishing the overwhelming character of care work, by stating the multiplicity of tasks and rehearsing a notion of being overwhelmed and not keeping up with the demands.

"Bad" Care = Insecure/Unsafe

Another task of caregivers is central, yet not depicted or addressed clearly: *Surveillance* of the wellbeing of elderlies. We find such expressions in mundane questions ("How are you doing?") but also in complex constructions. One particular instance is Alma having her stroke: her daughter finds Alma lying on the floor, alarmed by a bumbling-noise hardly perceptible for the audience of the video. Alma was lucky that her daughter was present, that she heard Alma collapsing, that she "sensed" something being wrong and accordingly hurried to her mother to help her. And it was her fast thinking that ensured quick intervention and Alma being saved.

It is this surveillance and monitoring of elderlies well-being, of their bodily-medical status, that puts additional efforts on care as practice – and constitutes a central problem that gets addressed in the videos: closeness. In both videos this concern is repeatedly rehearsed. One such statement is to be found in the sequence quoted in the beginning:

> Son: So we find ourselves an hour away from dad. It is that which creates a problem. And in the same time we find that he needs our support, needs our help.

Tasks of surveillance and proximity are strongly interrelated in modes of traditional care: Here, to get a sense of "how one is doing" demands the physical proximity to those being surveilled. This notion is rehearsed repeatedly and emphasized as demanding. To know how one is doing entails primarily to know about ones bodily well being, at least in the characterizations in the videos: Concerns are occupied with identifying changes in the status of the elderlies (mainly in terms of digression) and intervening in cases of emergencies. Simultaneously, such a framing constructs these interventions in traditional modes as passive and reactive. The instance of Alma's stroke is one case in point, as her daughter only can call for help after the stroke occurred, yet was not able to identify indicators for the stroke beforehand. This frames surveillance of wellbeing as highly problematic due to its reactive and unreliable nature. Traditional care is shaped in terms of its demands to the caregivers that need to be close-by the elderlies in order to be able to ensure their wellbeing – and simultaneously is constructed as unreliable in *preventing* emergencies.

"Bad" Care = "Bad" Communications

A related issue is raised in the story about Alma: communication. This revolves around the administrative and bureaucratic hurdles of institutional care:

Example 1:

> Alma's Daughter: "[…] She having electronic records of her medical history and her current medications created so we don't have to sip through a lot of paperwork. She had to get a new doctor once, right? You always have to get all the old history and give it to the new doctor well we did not have to worry about that she had everything on –" (LeadingAge CAST, 2012a, 1:59-2:05)

Example 2:

> Docotor: "Because Alma's in a care network we had her entire electronic medical record when she arrived. We knew her conditions, medications and allergies. It helped pinpoint the right treatment for her stroke. We even knew - what medication she took last and when from her medication adherence records. It probably saved her live." (Ibid., 2:55-3:03)

Example 3:

> Alma: "Ooh that's so nice - you all move fast - back in my day a patient would show up with a six-inch-thick folder in their lab and it would not be till then that rehab people could start their work." (Ibid., 3:35-3:41)

Example 4:

> Nurse: "When Ernesto does come in to see us, we will have an updated record of everything that has happened to him. So it's all there for Doctor Levi to view when he does see Ernesto." (…)
> Doctor: "I know Ernesto for about a year but I think you would be surprised how well I know him medically: I know his heart attack was a year ago, I know the medication he was on, I know what operations he had." (LeadingAge CAST, 2005)

Example 5:

> Nurse: "It's like a log of everything that happens." (Ibid.)

Paperwork, paperwork, again and again. It is a concern in the story about Ernesto, just as much as it is the case for Alma's story, making care work additionally difficult. It is described as being

time-consuming and creating inefficiencies: First, as the family members have to deal, understand and work through numerous documents to ensure access to medical services. Secondly, as medical institutions need to process large amounts of documents as well, this is staged to potentially become problematic: it slows down medical treatment in emergencies (example 2), but it also slows down further treatment and the movement of patients through different institutions (example 3), resulting in inefficient treatment that is either dangerous (in the first case) or expensive (as in the second case). Communication and coordination of care are framed as a fundamental part of care, and traditional forms of care are described as inefficient and exhausting for informal carers and resource consuming for institutional providers.

These depictions of traditional care are dominated by a negative framing, usually achieved through contrasting it with CAST's positively framed vision of "modern" care. Additionally to the rhetoric of improvement (I will touch upon it later on), traditional care is framed as problematic. The recurring negative problematization hinges on three categories: Issues of closeness and availability, issues of safety and security and issues of inefficiency and costs of care – all of them framing care work as exhausting and overwhelming for informal caregivers and redundant and unnecessarily complicated organized for institutional care service providers.

"Bad" Care and the Deficit Model

When applying the perspective of the deficit model this becomes particularly clear: Here traditional care is occupied with a variety of undirected concerns that are passive in their organization: Intervention happens only *after* Alma's stroke due to inefficient monitoring of bodily parameters. This holds also for the need for being close-by Ernesto to provide the necessary assistance. I described how these concerns are symptoms of his bodily deterioration. Traditional care is undirected and unorganized, also due to *bad* communications (between different caregivers and institutions) and insufficient monitoring. Instead of caring for bodies through monitoring, as finally done so through the implementation of technology, care is concerned in its traditional forms with the effects of bodily deterioration and the incapacities of elderlies to manage them rightfully. This blind spot of traditional care is performed throughout the videos. Care appears to be messy and unorganized.

The framing of traditional care as unreliable, inefficient and highly problematic is built on he deficit perception of late life, where incapacities need to be identified, managed and adjusted. The concern with bodily deficits and the inability of its maintenance is the key for understanding this construction. Relating back on how technology is ought to improve caring for elderlies (cp. Chapter 9), this becomes particularly clear: As deficits of elderlies in their social standing are tied to (medical) deficits of their bodies, their surveillance and monitoring becomes necessary. Bodies are framed in terms of embodies risks and a key task of care is focused on managing these risks to ensure prevention. Yet, in traditional care these technologies, that only make the embodied risks visible, are not used as means to identify and calculate these risks, deeming it to rely on reactive

measures. Care in traditional settings becomes exhausting and overwhelming for the caregivers; expensive, redundant and expensive on the structural level, as it relies on bad (traditional) communication (paperwork), insufficient means for managing risks (due to a lack of technologies) and its being undirected: Undirected, as it is not focused on medical/bodily parameters of the elderly, but on symptoms that are linked functional-causally with the body, yet are not recognized as such in traditional care settings.

As such, tracking medication intake, surveilling nutrition, being there to see how one is doing – they all are unidirectional and unorganized means for care, not meeting the actual requirements of good care in CAST's terms.

2.2| "Good" care in modern terms

Following the argumentation from above, this also constitutes the strength and advantage of modern modes of care presented in CAST's vision. By contrasting modern modes of care with the negative image that gets constituted for traditional caring, the former gets established as a concern of monitoring bodies, making their embodied risks visible and managing them. Such an intervention (shifting the focus onto the body) fosters the apparent lack of capacities of traditional care. Additionally it shows how such a focus can improve other aspects of care, here primarily communications and therefore relieves informal caregivers from the burden care is characterized as. Care then is not transformed in a softened and less exhausting task, but it becomes increasingly obsolete through its delegation to technological mediators and the shift of agency over body-maintenance to medical experts who are primarily concerned with "getting their numbers right".

The central theme of the films is the care-network. This has been touched upon in the previous chapter by focusing on the technological parts of this concept. Yet, as described by the nurse in the 2005-videos: "The caregiver network is two things: it's people supported by technology." I described how through quantification of bodies, concerns of aging are shifted in focus to that over embodied risk, their surveillance over time and the following virtualization and trajectorization of elderly-bodies.

This concern over bodies is well rehearsed in representations of modern care in the future-vision of CAST. The body is the central subject to care work, as it is performed as task of maintaining (medical) bodies. For doing so, performances of good care are arranged around the problems identified earlier to be associated with what gets coined as ineffective traditional modes of care: Bad communications, unreliable surveillance, exhausting demands on informal caregivers due to a multiplicity of tasks that demand closeness and availability.

One such instance for how technologically assisted caring can ease the burden, elderlies apparently are, are means for delegating tasks of surveillance to technological devices, such as smart watches, in-home-monitors and sleep-monitoring. What they have in common is their

focus on medical parameters to assess wellbeing, making modern care appear better-focused on what seems to be the actual aim of care, namely the maintenance of bodies.

On the occasion of introducing the smart watch:

> Grand-Daugther: „He's got a special watch. The watch monitors his vital signs and also acts as an alert.
> Daugther-in-law: It just prompts him to take his meds, it tells him weather or not to take it with water to take it with food (..) that's a wonderfu- that's a life saver." (LeadingAge CAST, 2005, 1:20-1:24)-

And on the occasion of doing the same for networked, built-in sensors:

> Son: „Well, the house is networked with sensors all around so it gives us a real good picture of what's happening in the house (..)"
> Dauther-in-law: „We don't have to be close by to see it. We can be anywhere." (...)
> [...]
> Son: We just look at the computer – it's right there: the stats, you know, everything we need to know is right there. (LeadingAge CAST, 2005, 1:30-1:43).

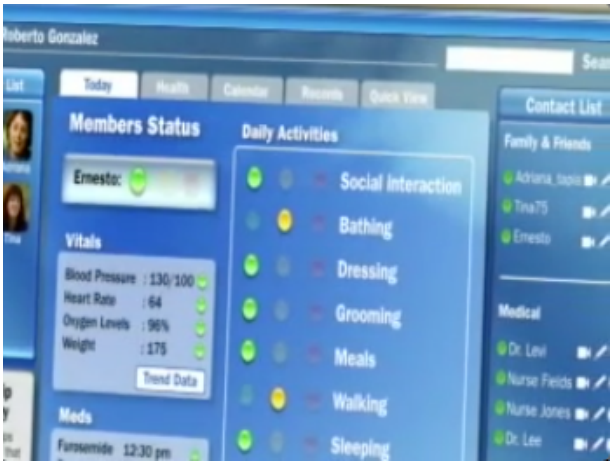
And, finally, on an built-in assessment tool operated on the TV:

> Doctor: „After a talk with the family we found that Ernesto was really into cards. So we sat him up with a solitaire game on the computer; a embedded assessment tool. That way I can monitor his dexterity, his reaction time, cognitive functions, and gives me an idea of how he's doing". (LeadingAge CAST, 2005, 2:20-2:29).

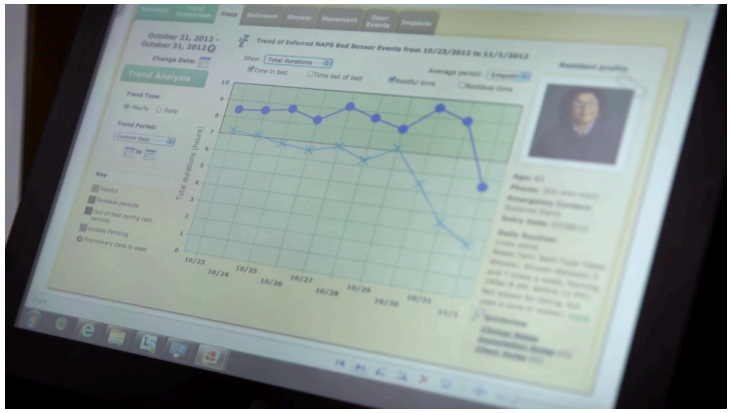
There are similar instances in Alma's case, such as the previously described introduction of the care plan, which ought to "get her back to normal". These instances show how technologies are introduced to overcome major insufficiencies of traditional caring. One problem associated with traditional care is the need for proximity, an issue commonly rehearsed as a major cause for the burden that care is performed as. Technological interventions, achieving the quantification – and thus virtualization – of bodies, are shown to overcome this issue. It simultaneously allows to increase the efficiency of care provided by institutional actors, as it allows the improvement of communications: Here the virtualized and quantified aspects of the body are made accessible via distance and in an ordered fashion to different actors in institutional care: The doctor, the nurses and other professional care-workers. They all have access to the quantified aspects over time: the "medical history". This allows more efficient and fast interventions, as medical practitioners "know right away" all the important information for pinning down the adequate treatment.

Modern care gets shown to focus on the maintenance of bodies and frames care in such terms. In the future-vision of care it is accordingly reduced to a caring of bodies – and is performed as overcoming challenges of traditional care through this focus. It pins the challenges to a lack in focus, as is continuously established in the videos. Accordingly, modern care's concern for the body is performed throughout the videos and we encounter it in examples given above. Given these examples and what has been said on aging and technologies in the foregoing chapters, it now becomes clearer what constitutes the logic of modern care in CAST's vision: Getting the numbers right.

Concerns over aging are translated into metric expressions that pin fragility and incapacities to bodily dimensions of elderlies and frame care as a matter of caring for bodies. In such a framing, care becomes an issue of getting numbers right – or in other words: to adjust deviations from norms. We encounter this in several instances throughout the videos – and charts and graphs play an important role in visualizing deviations that trigger interventions, later-on framed as care-work. It finds its expression in Alma's doctor who does not "like" the numbers on Alma's sleep-patterns and finds that she does not meet expected movement-values.



Particularly visual depictions establish this impression of care-work being one of normalization, of matching numbers. One such example is the distance-monitoring system that summarizes Ernesto's status for his relatives. Here, Ernesto's wellbeing is broken down into broader categories: Interactions, bathing, dressing, grooming, meals, walking and sleeping become visualized in a coloring scheme that signifies Ernesto's status - green, yellow and red - and concludes an over-all wellbeing of Ernesto that is broken down also in a traffic-light-scheme between green, yellow and red. Normalization aims at meeting thresholds: Is xy bathing enough? Does he/she eat sufficiently? Are normal values of exercise met? Underneath such a determination of care along thresholds lays their definition that explicates the political dimension of care and technology: It manifests social norms in technological setups that make norms durable (Latour, 1990) in the definition of thresholds. Thresholds capture aspects that serve for the maintenance of bodies (bathing, dressing, grooming, meals, walking and sleeping all address this issue), while "social interaction" gets subsumed in one single aspect. The definition of thresholds follows a normative logic of what well-being is to be perceived in a strong medical logic. Good elderlies are those that follow a "healthy" lifestyle and keep good care of their bodies. And only in the case of bad maintenance, of "not matching the normal numbers", interventions are triggered that re-assemble "actual" care-work.



Similar visualizations that foster an impression of care being directed at adjustment of numbers can be found in professional settings, with a greater complexity of charts and graphs that also indicate the well-being of care-recipients. In these instances we also witness the trajectorification of late life that

allows the identification of deviations from norms. Here the depiction of Alma's sleep patters serves as a good case in point. Again, intervention is triggered as Alma does not match normal sleep parameters and care work is mainly characterized as adjustments of deviations from norms that regard bodies and their maintenance.

2.3| Who is it to care? Agency over Bodies

The quantification through technological intervention enables this new focus and allows caring even without the physical presence of the body. Modern care deals with the maintenance of bodies. A good case in point is the introduction of the smart watch that prompts Ernesto to take his medicine. Here, the question of agency over caring for ones body can be posed in all its complexity: As Ernesto is overwhelmed by the correct administration of his pills the small device on his wrist steps in to provide assistance. But is it still Ernesto who is carrying out the maintenance of his body? Things get messy, and touch upon issues of compliance with technological devices: If one takes the stance for Ernesto still being the agent of his own body-care, it comes into question in how far Ernesto is still able to neglect from taking his pills. The videos don't show a reluctant user that acts against the machine. Yet, it is well in the spectrum of possibilities to have Ernesto not following the advice of his watch, neglecting to take his medicine. If one is about to acknowledge Ernesto's agency over his own body and his potential choice of becoming a resistant user, the device is not capable of exercising power over Ernesto's intake. Yet, the videos do not problematize such deviations from idealized compliant users. Debates over the freedom to neglect medication have been taken up within ethics of care (cp. Baldwin, 2005).

We encounter a number of things that are immanent in the performance of modern care: First, social norms are inscribed in the technologies that become problematic when posing this question of agency. Secondly, power-relations are incorporated in the machines and fosters the hegemony of adults and experts just as much. Thirdly, the rehearsal of the deficit model re-constitutes this hegemony and positions elderlies in such ways as that they are ought to willingly delegate their agency to others, leaving no space for non-compliant users.

The first issue is tied to the second: Elderlies need to be willingly compliant as to ensure modern care to work. If Ernesto is persistent in his agency over his body and decides to enact this agency different to the intents of the technology, this quickly becomes problematic. The issue raised in the example with the smart watch is a good case in point and can easily be broken down onto other examples. Yes, Ernesto potentially has the agency not to comply with what the watch tells him to do. But is this the case for other devices too? Let's imagine the case of Alma talking to her doctor in one of the later sequences of the 2012-videos: Here the doctor is advising her to exercise more and Alma is fast in re-assuring him that she will take his advice in consideration. Yet, this advice is based on the medical data the technology is prompting. Tracking Alma's behavior over time leads him to the realization of the need for better exercise in the first place.

We see two important things here. The first is that technology again takes over the maintenance of the body: It is not Alma who is supervising her exercise, nor are it her relatives or the doctors, but the algorithms monitoring her behavior and notifying the doctor that something is not meeting the normal or wishful parameters. Where this performs modern care superior to traditional care, as it is focused on the "right" aspects of Alma's being (namely its medical aspects), it also re-assigns agency. Alma is not to be concerned over her body anymore, nor is it her family. Technology is stepping in. The second aspect here is the role of the doctor, or more generally that of medical experts: One can understand the doctor's advice as an enactment of power over her body: "You are not within normal parameters, you are deviating, so we need to facilitate correction."

Returning to the question of agency, this appears less tricky now. This is due to the possibilities for Alma to depart from the suggestions and become a non-compliant user. Whereas Ernesto allegedly could become a non-compliant user just by refusing the medication intake, this becomes more difficult for Alma: Here the authority of doctor to speak on behalf of Alma's body is stronger then that of the smart watch in the case of Ernesto. After all, the technology will recognize Alma's reluctance to exercise immediately and will trigger further interventions of the doctor.

This highlights a key-aspect of modern care: the delegation of agency over bodies through the implementation of technology. The deficit model of late life raises the concern for body-aspects as a public concern: Elderlies are not acknowledged to have the capacity to maintain their bodies on their own, accordingly constructing the concern of care with bodies as one of its primary characteristics. Introducing technologies that are ought to visualize medical aspects of elderlies' bodies manifests their agency in the hands of medical experts and caregivers and undermines the agency of elderlies over their own bodies. In return, non-compliant users (i.e. the elderlies) become potentially problematic for this modern mode of care. Yet, in this framing the problem is not located in the system undermining the agency of the elderlies, but potentially would put blame onto the non-compliant elderlies who are not acting on the terms of the technological set-up.

The technologies turn out to reestablish the deficit model in black-boxing it. Just as they are built on it and follow its logic, they materialize it through its inscription: Inscribing the deficit model into the technologies black-boxes fosters power-relations by assigning agency to medical experts and care givers and taking it form the elderlies: After all, non-compliance becomes more difficult (yet not impossible) in the backdrop of quantification. This follows arguments of Akrich (1992), Woolgar (1990) or Winner (1980), but also discussions form ANT (Latour, 1990) that argue for the politics and power of technological devices resulting from norms inscribed in devices and reflecting back on the user. It is not possible to make statements on whether and how elderlies as users may tinker with the devices, re-interpret and de-scripe them, based on the videos. It may be a worthwhile exploration.

3| Care and the Deficit Model of Late Life

The deficit model of late life is built into care-practices imagined by CAST as it presents care-work as focusing onto adjustments of deviations from normalcy. A quantification-discourse established technological intervention as "fix" to deficits that are located in the body of elderlies and referred to as risks. In this construction, elderlies get referred to as embodying risks that need constant monitoring, accomplished by technologies. The quantification of elderlies allows the virtualization and trajectorification of bodily aspects of elderly that then get under control of care-agent (both, professionals as well as informal care-workers). These agents of care mainly are performed as intervening in case of deviations from normal-values and thus care in CAST's vision is framed as a concern of maintenance of normal-bodies. Simultaneously, following the deficit model's ideology, elderlies are performed as in deficit, at risk and thus requiring adjustment of their bodies and marginalized identities. As such, elderlies get objectified to interventions through others, and simultaneously loose their agency over their bodies through delegation. Where elderlies are performed as passive recipients of care, and care is performed as an effort of adjusting deviation from normalcy, the deficit model gets re-established in the organization of care: As it follows the deficit ideology, care is organized in such ways as to reinforce it's ideology. This gets established in thresholds that define well-being along medical and bodily parameters, as well as in tasks taken over in modern care-settings, that mainly focus on the maintenance of bodies on the elderlies' behalf. This then feeds back into the deficit model of late life, as it shows to "free" the elderlies from concerns over their bodies. Although bodily deficits are not overcome, their maintenance is carried out through others and thus disconnects elderlies identities from their bodily aspects.

The deficit model is a central ideology running through the depictions of age, technology and care, and substantiates and informs their performance in its terms. Simultaneously, performances of age, technology and care feed back into fostering the deficit model: As the performances build on deficit-ideologies they rehears and materialize them in practice. As such, the deficit model runs through the performance of CAST's future vision. It constitutes the social norms and values that shape the representation and feed into performances of care, technologies and late life itself. As such, care can be established as the social system that frames late life and technologies, building on the deficit model. It gives the social grounds to both and offers structure for the representation: What gets depicted are late life and technologies within care-structures. In return, care must be understood as care of those in late life in terms of the deficit model and in assistance of technologies that are built to facilitate care within the model's terms. As such, the deficit model appears as set of social orders, norms and values, interpretations of the world, that then feed into how CAST imagine its future of care, late life and technology.

Chapter 10

PROBLEMATIZATION OF THE PRESENT, FUTURES AS SOLUTION

For establishing its vision of the future, CAST applies a number of rhetoric and visual techniques that constitute this vision as meaningful and wishful. A key means is the framing of current states to be problematic in the backdrop of a bright and exciting future that needs active engagement. In this perspective the videos appear as a political device for enlisting actors that appear potentially important for realizing CAST's visions. The framing and establishment of concrete problems and their solution in the introduction of new technologies help facilitating a notion of future-promises.

Technologies get introduced as OPP, "obligatory passage point" (cp. Callon, 1986), in terms of a "technological fix" and diverse actors are aligned accordingly. This is achieved in contrasting the fix with the problems that get established through the deficit model of late life. In this chapter I am going to outline how (**1**) the present is framed as challenge that needs overcoming. Not only does such a construction allow the establishment of a common goal (overcoming concrete present-challenges), but it also aligns actors accordingly. In (**1.3**) I provide interdefinitions of the actors that support the negative framing of the present. Simultaneously (as discussed in **1.2**) such an analysis of the narrative setup of CAST's videos allows its positioning towards the present as well as the future.

Departing from the challenging present, CAST introduces its technological fix (**sub-chapter 2**) and positions it as OPP (**2.1**) – with consequences for how the different actors' identities get re-specified in response to the introduction of AAL as new actor (**2.2)**.

Sub-chapter 3 will further elaborate the ramification of care, the implementation of the technological fix brings with it. Here particularly consequences for different actor's positioning within the network of future care will be in focus (**3.1**). Finally, in **sub-chapter 4** I draw first conclusions on CAST's practices of future-making as applied in the videos.

1| Framing the Present in terms of Challenges

CAST utilizes a number of techniques to establish the problematic character of the present and to associate different actors with being affected by these problems in negative ways. One is directed at care, and has been described in the respective chapter: It is framed as problematic and challenging, overwhelming and of poor quality via a number vehicles: On a structural level it is performed as ineffective, characterized by poor communications and resulting in a large waste of resources due to oversized bureaucracy, slow infrastructures and poor information provided to care service providers that impact the quality of the services they provide.

1.1| Structural challenges of the 'present'

By doing so, a number of actors are shown as to be affected by these poor present states of care: For once elderlies themselves suffer from bad care quality, where caregivers only have little time for their clients to care for. This then increases the risks for overlooking indicators for deteriorating health or needs of elderlies that cannot get expressed due to a lack of time. Another aspect of this limitation is the increasing social isolation of elderlies, as carers do not have time nor resources to simply spend it with their clients. In the long run, this poor quality of care then even runs the risk of elderlies suffering in their health, as they only receive basic care services that deal with immediate needs.

Another aspect of this structural insufficiency is framed as impacting care service providers themselves, as they are shown to loose money due to their insufficiencies, as it gets coined in the introductory text of the 2012 videos: "Older Americans receive POORLY coordinated care. Health professionals communicate inefficiently creating REDUNDANCY and ERRORS. Our country spends TRILLIONS OF DOLLARS to receive sub-par quality and disjointed care" (LeadingAge CAST, 2012a). Professional carers run the risk of making errors – again not only impacting their clients and their relatives, but also the reputation of the facilities. One such expression is to be found in Alma's video where repeatedly insufficient coordination of care in traditional modes gets rehearsed. Alma stresses that "you all move fast", and her doctor in the hospital explains that new technology potentially saved her life, as her medical history was at hand immediately to pin-point the best treatment for Alma, and a physician explains that the system red-flagged him when wanting to prescribe medication that was not compatible with other prescriptions – again contrasting the negative insufficiencies of traditional care that are susceptible for errors.

CAST frames "the present" to be problematic for care service providers and their clients. And they get shown to be problematic for relatives. Structural care settings are staged as overwhelming and unbearable for informal caregivers. This is associated with poor infrastructures immanent in traditional models of care: Large bureaucratic hurdles get established as one aspect of where the problem gets located. Dealing with different care service providers is described as encompassing large amounts of paper work, and "getting medical histories right" is described as being a large concern for caregivers. This is partially related with insufficient support offered to informal carers, again related back to the scarcity of resources on structural levels of care. Here the overall organization of the care-system gets additionally mobilized, where financial support is scarce and informal care is the main means for providing assistance for elderlies. Associated with this issue is the large complexity of regulations that administrate care on an legal level in the US, an image that gets established in the notion of "paper-work" (cp. *Prologue: (Inter-)Acting in Medical Worlds*).

1.2| Individual challenges of the 'present'

Besides structural insufficiencies, the present is performed as problematic on an individual level too, pinned down on the exemplary stories of Alma and Ernesto who are performed as stereotypical elderlies. This depiction of two individuals for the audience to associate with allows translating structural problems to a more personal level. Here problems and challenges are broken down into everyday terminologies of individual stories that appear to be "taken" from everyday situations different audiences can relate to. Common notions of stereotypical situations get mobilized here: The worries about how elderlies are doing, when one it is not with them, the challenges of managing one's own life while caring for others, or the concerns of financing care and ensuring its quality. These challenges are described in previous sections of this contribution.

At the root of this problematization rests the body and its embodied risks: The deterioration of bodies is performed as constituting the initial problem of aging and care is performed as a concern of maintenance and care for the body. Yet, due to the structural inefficiencies and redundancies of present care, these efforts are uncoordinated and lack quality. Here the body, as explicated in the respective previous chapters, is placed at the heart for constituting the negative framing of the present.

1.3| Interdefinition of Actors

These means of framing the present than constitute it as problematic and unbearable for three key actors: Elderlies as clients, there relatives as informal care givers, and professional care service providers that have to deal with complex and redundant infrastructures that make their work costly and challenging. In constituting such a problematization, CAST establishes *interdefinitions*[36] (Callon, 1986) of the three actors, as well as of their bodies:

Bodies: Bodies are placed as being at the root of the problem: Their deterioration is framed as causing the marginalization of elderlies. Simultaneously they are shown to be not sufficiently in focus of care, as embodied risks do not get identified and deems carers to respond only to their materialization in emergencies. Bodies accordingly are not treated sufficiently in present states and become problematic for the other actors.

Elderlies: Due to the insufficiencies of present care infrastructures, elderlies are presented as on the margins of society: They suffer from social isolation and are challenged and overwhelmed by the demands of caring for their bodies. Accordingly, they become depicted as increasingly incapable of caring for their bodies, resulting in a loss of autonomy – their central wish, as established in the videos. Thus, aging is described as a suffering, medically as well as socially, and presents elderlies as being in deficit, particularly in terms of their identity that is described in terms of second childhood and

[36] Refer to the respective chapters for detailed elaborations: Age and Elderlies: Chapter 2; Care and Caregivers: Chapter 4; „The Body": Chapter 2-4; Technologies: Chapter 3.

a "mask of aging". Here bodies are presented as the "root of the problem" and their maintenance is the main concern of care. Simultaneously, elderlies suffer, as they suffer from the deterioration of their bodies. Yet this concern is not acknowledged accordingly, as both, elderlies as well as their informal caregivers are not capable of addressing these bodily insufficiencies.

Relatives/Informal Caregivers: They are presented as being overwhelmed by the demands of caring for their relatives. Here a discrepancy in their own life and of those they are caring for is established, where their efforts simultaneously appear undirected and reactive. Being an informal caregiver then entails to suffer under the burden that elderlies become for them at shows them to be under constant pressure to administer care that turns out to be inefficient and unreliable due to its missing focus on bodily dimensions of care as the "root of the problem" (cp. *Chapter 2: Future of Late Life*). As they lack the means to control and manage the incorporated risks of elderlies, their efforts of caring for their relatives appear uncoordinated and inefficient and thus overwhelming.

Care Service Providers: Although concerned mainly with the medical treatment of bodies, they are only capable of intervening when emergencies occur. They lack the capabilities of managing embodied risks, as they remain invisible. Bad (communication) infrastructures exacerbate these problems, as information travels only slowly, making correct and efficient treatment of bodies additionally difficult and impacting the quality of their services in negative ways. Preventive measures that allow embanking demands put on professional medical/care services are not possible either, as prevention demands – in the framing of CAST's vision – the identification of the embodied risks.

1.4| Positioning of CAST

Such a framing then also positions CAST within this setting: It constitutes CAST as aiming to overcome these challenges by providing a technological fix and puts it in relation to the other actors. CAST being an interface organization, as described previously (cp. Chapter *6: (Inter-) Acting in Medical Worlds*) is representing care service providers. Accordingly, elderlies are presented in terms of recipients of care, as "clients" that rely on care – and thus facilitates a unidirectional care-relationship, as described by Winance or Mol (cp. Chapter 9). The problematization of care in the video's terminology then constitutes the need of intervention on several levels. CAST positions itself as to be able to provide a solution, establishes its relevance in terms of an OPP and aligns the actors as to co-operate with CAST on its realization: To achieve improvement of care by re-focusing on the body with the mediation of CAST. The problematization of present states of care then only opens up the possibility of improvement in the first place, and constitutes the necessity to co-operate under the lead of CAST as a coordinating institution.

2| Achieving the Future - Overcoming the Present: Technology as OPP

The deficit model serves as a key device in establishing the problematization of present states and the construction of future-technologies as solution to these problems. Simultaneously, the videos are organized in such ways as to align actors to *need* this solution and to *rely* on CAST to achieve it. The visualization of embodied risks is performed as key in providing this solution and technologies are staged as realizing this virtualization. Simultaneously quantification and virtualization are shown as to be achieved through the body, relieving the actors from the problems they get associated with in the beginning. Accordingly, they establish the need for the focus on the body in order to improve care, using the deficit logic of late life, and present this need to be wishful for the actors: for the body to be taken care for sufficiently, for elderlies to ensure their autonomy, for their relatives to be relieved from the burden of caring, and for care service providers to reduce costs and address the growing demand for their services whilst ensuring the quality of their services. In order to achieve this, the videos constitute the necessity for introducing technologies as a new actor that allow shifting the focus towards the body and thus overcome present problems. As such "the future" imagined by CAST is a political device for aligning actors, re-specifying their identities and bringing them under the lead of CAST as coordinator for action by establishing the implementation of new technologies as an OPP (cp. Callon, 1986).

A number of means are applied to establish this obligatory passage point within the framework of CAST's videos: Problematization, as described, establishes the body as the appropriate subject for intervention. This is achieved via the association of problems with bodily deficits (deficit model) and the establishment of age in its deficit logic via the body. CAST tells its future in nuances: Shapes it accordingly to make it "speak" to the different actors. Accordingly, there is a future of care (Chapter 9), one of technology (Chapter 8), and one of late life (Chapter 7) and these futures are additionally specified so they matter for respective actors: caregivers, elderlies, or policy-makers, for example.

The second mean is to portray traditional social structures to be overwhelmed by such a situation and structurally incapable of handling care appropriately in the backdrop of increased demands of demographic change. Here this incapability is grounded in the lack of focus in traditional care work, being unable to adequately address "the body". This feeds back into the initially described discourses on "care crisis" and "aging societies" and rehearses their repertoire. I further discuss this in my conclusions. The third means is the establishment of embodied risks and their invisibility in lack of adequate technologies that are able to capture risks and take them in calculation.

This then also structures the set-up of the videos presented by CAST, where multiple rhetoric and visual means place bodies under distress and in deficit (mainly via visual means, in depicting insufficient and fragile bodies; cp. Chapter 7), show the incapability of care (mainly rhetorically in

descriptions of informal caregivers, cp. Chapter 7 and 9) and introduce technology as an key actor for addressing embodied risks (visually and rhetorically, cp. Chapter 8).

Here, technologies are introduced in the care network (Chapter 8 & 9) and positioned as obligatory to facilitated the improvement of care in CAST's future-vision. Now how is Ambient Assisted Living framed as OPP?

2.1| Showing how it works: Establishing AAL as Technological Fix

Tablet computers are performed as crucial to unlocking CAST's future. Not in their material existence, but in what they contain and make accessible: Information, mostly in terms of data. Doing so, it is the tablet computer that facilitates the substance of the video – and explicates the initial future promise.

Depiction follows medical experts examining and advising Alma and Ernesto. In doing so, they occasionally refer to their computers to retrieve important information. In a brief moment, the viewer gets to see what is on these computers: data. Throughout the videos medical experts refer regularly to computer screens (always showing similar interfaces of data matrixes) in order to retrieve information on their clients: prescriptions and medication intake, sleep patterns, treatment plans, etc. In this, the computer is referred to in a side-gesture: It never dominates the depicted interaction between humans. The device is presented as a means to facilitate human-human interactions through making information on clients accessible. Here a crucial dimension is adjoined to CAST's future-promise in detailing a central value of care: personal interactions between humans, or in other words: communication. *Bad* communications get identified as a crucial uncertainty in caring practices: Bad communications result here in late medical assistance in case of emergencies and in erroneous treatment due to incomplete information.

The future-promise of improved care gets substantiated with more concrete advice on how to resolve the problem constituted in the future-threat: It places communication as a factor in improving care. *Good* communications are thereby framed as providing a vast amount of information in as efficient a manner as feasible: Only if the right information is made accessible in the right time to the right persons, optimized care becomes possible. The computers (and their screens) then become a placeholder for providing information and facilitating communication. They are open windows to the quantified properties of elderlies, and particularly their embodied risks. Simultaneously the computers are shown not to disrupt another aspect of communication: The video depicts different situations in which humans interact with elderlies as their clients as to treat them, help them in rehabilitation and – ultimately – bring them "back to normal". The videos build on interactions between humans as moral values established in caring ethics. In this, technology must not disrupt the visualizations by dominating interactions. Accordingly, medical

experts – and more generally care providers (informal as well as formal) refer to their computers in side-gestures, focusing on their clients in the care-work[37].

Fast and efficient communications get emphasized and contrasted with the consequences of inefficient and costly ones – for the lack of technological assistance. A two-fold improvement gets constructed, as improved communications affect structural inefficiencies and cause personal benefits (cp. Chapter 8). The double-construction of a future-promise (re-establishing and ensuring autonomy) in the backdrop of the problematization of pasts gets rehearsed – and resolved through technological intervention. In an uncertain present of "bad" care-practices, elderlies risk loosing their wellbeing and autonomy (through non-identified embodied risks and the lack of their management). Only the technological intervention prevents this erroneous, inefficient and redundant treatments and care – associating the initial risks with bad communications and thus overcoming them through their improvement in the implementation of innovation technologies.

One key aspect in establishing technologies as OPP builds on the dichotomy of bad (i.e. inefficient, referring to the problematization of present states) and good (i.e. efficient, referring to their improvement in the future-vision) communications. The future-threat off loss, risks and growing deficits plays a crucial role in establishing this dichotomy that finally allows to position technology in regards to realizing the future-promise by providing a fix. The future-promise of improving care is then problematized along this dichotomy and associated with communicative acts of exchanging information. In this, "the future" is substantiated by positioning the technology in relation to the problematization of the present. Roles of other actors are specified in accordance to this framing and in relation to the technology – depicting and explicating the roles of care*givers* and care-*recipients* in a relationship of dependencies and clear assignments of active (caregivers) and passive (care-recipients; "clients") roles. The enhancement of communication is achieved through technologies providing data on elderlies' bodily health, their daily routines, behavioral profiles and them following their treatment plans. This information is then distributed to medical experts (nurses, doctors, rehabilitation centres, care services, etc.) via the screen of the tablet computer. The medical experts mainly serve as interpreters of technologically provided ("mediated") data and conclude on adequate treatments. The experts judge data and interpret it, whereas elderlies only have to follow the advice provided so.

The data provided by the devices corresponds with a quantified abstraction of elderlies. Aspects of their bodies and their medical parameters – namely those judged relevant for assessing the right treatment – are quantified and objectified when translated into data through measurement. Elderlies have no control over these quantified aspects anymore, as they cannot directly influence

[37] An important aspect to mention here, is the shift in the rhetorics of promoting AAL that is payed attention here: In the early promotions of AAL a rhetoric of efficiency and substitution of humans through technologies caused a strong critique through (amongst others) care ethics. In this, the here-applied rhetoric falls in the new logic of arguing for efficiancy in care-practices through the improvment of ist quality in human-human interactions (technology as assistance, not substittion). This example of adapted promises would be an interesting case on its own, especially in regard Brown & Michael 2003.

this data anymore. In this elderlies loose authority of medicalized aspects of their selves to the medical experts – but also relieves them from the duty of communicating their wellbeing to the doctors on the right terms. This is a crucial aspect in how technologies are framed to improve eldercare. It further establishes the responsibility of the doctors to provide the right treatment based on the authority over medical aspects of aging bodies – that is again surveilled and monitored by the technology keeping track of the doctor's and other's treatment-choices. In this, the improvement of care is staged as to be achieved in technologically facilitated trade-offs of authority and responsibility, where elderlies mainly remain compliant and trustful, yet passive actors while undergoing treatment and rehabilitation. They are only responsible for following the advice of the medical experts, whereas the trustworthy experts are responsible for providing valid expertise and data-judgements.

Simultaneously, standardization is staged in less critical ways, as it is commonly addressed in contributions to this topic: "An implicit assumption in the humanist social science critique is that health care providers deliberately objectify [...] patients by broader technological and social forces" (Timmermans & Almeling 2009, 23). This critic is countered in the video, as standardization is shown to accomplish the realization of good care. Timmermans & Almeling argue that "reduction [...] leads to amplification of knowledge. The scientists forfeit resemblance but are compensated with statistical associations between key variables" (Ibid.) and although objectification is a key characteristic of caring in medical settings, "objectification may be closer to an inevitable way of getting things done in medicine than humanistic critics imply" (Ibid.).

2.2| A New Actor in the Network: Interdefiniton of Ambient Assisted Living

The technology – centrally depicted through computer screens as windows to data – is performed as what I want to call the *middleman* of information: Middlemen are largely invisible actors, facilitating action rather than being themselves dominantly active. Technologies are performed as not interfering in interactions but facilitating and improving them subversively (or quasi-outside of the social) – and objectification is a central means that allows doing so.

They are referred to in side-gestures, yet they are crucial in ensuring care through effective communications. Being characterized as a middleman, it is crucial for the technology to remain largely invisible, not interfering in interactions of humans. Accordingly, the production of data as a critical moment of intervention remains hidden and black-boxed throughout the video. Systems are not shown to monitor, surveil, and measure in order to produce, process and exchange data. Data appears more or less to magically on the screens of the tablet-computer, without explaining where it comes from and to what aspects of Alma it refers to.

The construction of technologies as middleman serves three aims in the depiction of the new solidarities associated with the introduction of AAL: It emphasizes the enhancement of human-human interactions as a key feature and dominant moral value of care-ethics. Simultaneously, by black-boxing actual interventions of the technology, human-technology-interactions are widely

made invisible. And it rephrased the deficit logic as a matter of embodied risks and places their management in the hands of experts – thus constituting a hegemony of the expert over their client's bodies whilst depicting this as improving all involved actors' situation.

In this, technology is staged as apolitical mediator: The performance of technology as middlemen makes them appear to operate outside social realms (and thus also not-to be-influenced by them). This alienation of the central technological part from social realms is obviously problematic, as it prevents notions of political artifacts being part of social worlds and deeply embedded in them from being addressed, by mobilizing the traditional technological imaginary of linear technological innovation: The technology appears readily developed and prepared for implementation in social settings, without being affected by them.

Simultaneously, this allows for building on central values of care, such as human-human-interactions, rehearsing and re-enforcing them to strengthen the positioning of the envisioned future as wishful and necessary: The depiction of technologies *improving* interactions between humans (instead of complicating them) simultaneously addresses a major critique & concern raised in regard to AAL: That of technological substitution of human interactions and the delegation of what is perceived as a key quality (and thus important moral value) of care in today's practice. Additionally, by black-boxing acts of measurement and monitoring, ethical issues and concerns regarding normalization and privacy are excluded from what can be addressed when watching the video.

> *Interdefinition - Ambient Assisted Living:* Ambient Assisted Living is introduced in the network relatively seamlessly. Their implementation appears easy and unproblematic, due to its characterization as middlemen. As such AAL is described as not interfering with interactions, but rather facilitating and improving them in their quality. The identity of AAL is performed as having the purpose to visualize embodied risks and provide information on them in data-matrixes to caregivers. Through this intervention care can be improved by addressing the initially established problems of "the present" (following the descriptions provided here and – stronger elaborated - in Chapter 4). AAL must not interfere with interactions, yet provide the means for their improvement, constituting its character as middleman.

3| Transforming Care by Making Its Future

Materializing CAST's future-vision turns out to be a highly political act: it manifests innovation technologies as deeply intertwined with the social, as it is depicted in a quasi-in-situ implementation. It builds a rhetoric where different actors are assigned with specific roles: compliant elderlies that follows instructions and accepts the technological invasion of their home and life. Medical doctors that judge and interpret data to conclude on the correct treatment, becoming data-analysts on their own. And technologies that remain largely invisible although they are deeply connected with elderlies and their caregivers. Depicting technologies in society

connects social and technological orders: In a co-productionist perspective, this then shows technology and society deeply entangled and mutually constituted: One cannot understand the technologies, subsumed under the term "Ambient Assisted Living", without the social contexts they get (imagined to be) implemented in. On the other hand, the social orders that are shown to evolve around the technological devices make sense only when being thought together with these very devices.

By bringing together social and technological orders, the videos establish a future-vision of technologically assisted care-work. Elderlies are performed through the dichotomy of successful and unsuccessful aging, where the former entails having the capacity to act autonomously and self-dependent, and the latter means losing this capacity. Care is shown to ensure this autonomy of elderly as its key aim – following the central logic of care, as put forward in care ethics (cp. Mol 2010 or Winance 2010). Being active and leading an autonomous live then are depicted as key moral values for being successful in one's aging. Simultaneously, this ultimate ends of care – ensuring autonomy – is put at stake, as risks for loosing autonomy are beyond control for individuals. Elderly, then, are constructed as depended on a – in the video's terminology - *care-network* that allows controlling and managing risks and their consequences, associated with aging. This care-network is then shown to be essential for the elderlies' "success" in their aging. Autonomous aging is dependent on strong supporting bonds – making "autonomy" an open-ended endeavor that must not be taken for granted and makes care constantly necessary, even if the elderly is doing well (i.e. is able to act autonomously).

This construction not only allows to plea for a constantly active network of caring, it also extends the concept of *care* itself beyond immediate assistance directed at overcoming existing impairments: It rather projects care in its actions towards a risky future and puts it in a position of responsibility for preventing future impairments through constant supervision.

In this, care carried out through relatives and human medical professional is shown to be unreliable and overstrained. Rather, technological mediation is necessary to provide this extended care-work. Technological devices – and here the tablet computer re-assembling different technologies – are shown to collect, process and facilitate information on elderly for ensuring right treatments and efficient caring. By doing so, the tablet computer represents a number of different technologies that act by and large invisibly: primarily sensors of all kind that measure and surveil, collect data, and transmit them to a central – but not defined – collection point. The tablet then is an ordering device (i.e. ordering the world and making it understandable and easily accessible), a window into the collected information, making it accessible in well-structured and thoroughly ordered ways. Objectification is depicted as crucial to assure adequate communication and provide sustainable care. Technology especially relies on these acts of objectification and appears as a middleman, establishing a relationship of trust between medical experts and compliant elderly-patients. Standardization then also loses its critical appearance,

and rather seems to foster the means for action. Simultaneously this can be seen as a rehearsal of an imaginary of apolitical technologies, traditionally criticized by STS (e.g. Winner 1986).

Ordering and processing the information (on the elderly) then enacts the technology as a middleman that connects different actors in the care network with each other. Technological devices are shown to connect these actors by mediating information – yet it is shown not to interfere in social interactions itself (which is ontologically different to not being shown to interfere!). In this, the technology is shown to fulfill the promise that is entailed by the extension of care: controlling and managing the future-risks embodied by aging bodies.

The roles of human actors, in being part of the care-network, get re-defined as well: being the interpretation of data to conclude the correct treatment, facilitating human-human interactions and operating technological devices by doing so. Crucial aspects of control are delegated from human actors to automated technological algorithms (that e.g. cross-reference drug prescription, communications, the elderly exercising, etc.). Associated aspects of risk, objectification and standardization, autonomy and dependence, and trade-offs of control and responsibility are at the heart of this shifting conception of care, as discussed previously.

The deficit model of late life does here not only serve as a means to establish the problematization in the terms of CAST, but it also provides a set of social and moral norms and values that allow the establishment of the different actor's as to align them towards the technologies as OPP and make them compatible with the visions of CAST.

3.1| Re-Specifying Actors Identities towards AAL as OPP: Making the Future work

With the introduction of AAL-technologies, re-definitions of the other actor's identities – their adjustment towards the future – become necessary. This serves to substantiate the promise of improved futures with how it plays out for different actors. Simultaneously the depictions assign specific roles explaining how the future must be translated in concrete social networks. Here are the re-specified[38] actor's identities after implementation of AAL:

> *Elderlies:* They remain passive in their construction, yet they are staged as freed by technologies. This achieved via the disconnection of their bodies from their identities through the mediation of technological transmission of their quantified aspects. Simultaneously, embodied risks become visible, re-shaping the care-network as a whole. Elderlies are positioned as passive recipients of care, where experts make inferences from data and impose their conclusions for the adequate treatment onto the elderlies. Elderlies must therefore be compliant users who follow the correctional advices in order to manage their embodied risks on the one hand, comply with the technological demands (fulfilling thresholds, providing their data, following the technology's advice and orders). There is no room for the rise against the machine, as previously described.

[38] This is more or less a summary oft he elaborations in the previous sections, brought together at this point in a summary of their performance in context of technologies.

Relatives/Informal Carers: Their concerns associated with care are taken up and delegated either to professional care service providers or to machineries. The latter take over tasks associated with cognitive impairments that hinder the adequate self-treatment of bodies through the elderlies, e.g. by automatically monitoring and administering medication intake. Through this, relatives are largely freed of immediate caregiving tasks. Yet they are performed as to care for their close ones in need of care. Thus they are shown to check-in with their relatives remotely via the technological systems. Easily graspable interfaces (think of the coloring-system summarizing the status, as described earlier!) facilitate this acts of assuring the well-being. On the other hand they act as ensuring the social inclusion of elderlies: Families are performed as being harmonic and interactions with families constitute the social inclusion of elderlies. Here, relatives are shown to be ready to use and implement the technology, assist elderlies in operating the devices and become part in the technological care-network in a position of complying to and reinforcing expert-advice. Beyond that, relatives are mostly shown as benefiting from the improvement as they are "freed" from the "burden" of caregiving – thus reinforcing the impression of fulfilled future-promises.

Medical Experts and Care Professionals: Their position is also transformed quite substantially, as they are the second side of the shift of agency over elderlies bodies and gain authority over the quantified abstractions of elderlies. In the end, they are performed as compliant to the technology as well, as they readily take their part as data analysts. They enforce the technologies' key position within the network in acknowledging the authority of the data provided and calculated by them, and inferring their advices from it. Without the technologies, medical experts appear helpless and mindless like the news-anchor in front of the blacked-out teleprompter. Medical experts and care professionals take over large portions of care work, as it is delegated to them via the implementation of technologies. Simultaneously they appear to take over these tasks more efficiently due to the technological mediation. Thus, their identity is performed in such ways as to be ready to act as mere interpreters of data and to be ready to take over this task.

Ambient Assisted Living: See above.

Bodies: They become risky due to the risks being visualized by technology. Bodies simultaneously become virtual and quantified, allowing the delegation of care work to machines and experts/professionals. As such, bodies must be performed as risky – and to be quantifiable and calculable. There must exist thresholds and normal-parameters in order to make them adjustable to these norms and to intervene as to meet the thresholds. As such, bodies are also shown to be compliant to the technology, as the allow measurements and as they respond to interventions taken by experts, professionals or elderlies following their advise. Bodies thus also are objectified, yet this

objectification is neither critical nor problematic but only constitutes successful interventions in the name of care, successful implementation of technology and successful identity management of elderlies (by allowing the disconnection form the body).

These framings of actors all feed into establishing technologies as obligatory to achieving and realizing the future-vision of CAST. They are presented in order to support the dominance of Ambient Assisted Living in the vision and facilitate the understanding of AAL having the capacity to actually improve "the present". As such, the different actors have to possess two central properties: A) to be compliant with the technology, as to show it working and B) to experience a substantial improvement due to the technologies in order to frame them wishful. This provides the means for establishing Ambient Assisted Living as a shared ideal working towards, as it is directly functional connected to the overarching promise of improved care. Yet, it also constitutes the future not really in terms of improving care only, but rather mainly the improvement of the different actor's situation, and by doing so also care. One symptom for this establishment of "wins" for all involved parties has already been described on the framing of autonomy (cp. Chapter 8) that only is embedded in this larger constitution of the necessity of Ambient Assisted Living as OPP.

4| Reflections: Establishing A Future Technological Fix

So what does this say about CAST's future-making? The introduction of AAL as OPP is placed in the intersections of a threat embedded in the (constructed) challenges located in the present on the one hand, and the (deriving from this challenge) promise of a bright future. This can be related back to the discussion of STS-approaches towards the future as epistemological object of inquiry. Here particularly the sociology of expectations provides conceptual means to situate the here given analysis within the larger context of future-making.

For Borup et al. futures can be understood as co-ordination-device to establish new technologies, provide them with meaning and situate actors towards them:

> "[n]ovel technologies and fundamental changes in scientific principle do not substantively pre-exist themselves, except and only in terms of the imaginings, expectations and visions that have shaped their potential. As such, future-oriented abstractions are among the most important objects of enquiry for scholars and analysts of innovation. Such expectations can be seen to be fundamentally 'generative', they guide activities, provide structure and legitimation, attract interest and foster investment. They give definition to roles, clarify duties, offer some shared shape of what to expect and how to prepare for opportunities and risks" (Borup et al., 2006, 285).

This can be established for this case: CAST establishes a vision of the future where technologies are improving care. Yet, this is just one aspect of what CAST is doing by establishing its future-vision. It further utilizes the establishment of AAL as OPP for achieving the future vision as argument for the need to develop AAL, rather then arguing for the need of the future (which yet get yet also established by doing so, and by contrasting it with the present's challenges).

CAST provides through the depictions of interactions with the technologies their benefits and constructs them as wishful, valid and properly working, along with what Kirby established for his diegetic prototype (Kirby, 2009). The described depictions of how AAL is able to improve the future in the backdrop of its challenging and problematic past show how this diegetic prototype gets established and substantiated: All actors profit from AAL in various ways, and the present one important argument for establishing these "wins": As AAL allows overcoming its challenges. This further substantiates the argument for the need of new technologies.

The concretization of present problems through their location in the body adds substance to the technological vision, allowing it to explain how technologies should look like. Yet, different to Kirby's elaborations, we do not actually "see" the prototype of AAL. What we "see" (and, for that, "hear" in the stories of the different characters encountered in the videos) is (mainly) the computer screen. This is substantial, as Kirby argues that diegetic prototypes are virtual materializations of future - yet not materially existent – technologies. The representations of AAL in the videos fulfill many key-criteria Kirby formulates for his diegetic prototype. They are performed as properly working, as easy to operate (intuitive interfaces, operated by various actors – experts and lays), reliable and to be easily implemented in existing infrastructures.

Furthermore the videos detail where AAL is ought to come to use. Yet, this is achieved in the virtual absence of the technology: they get shown whilst sparing them from actually getting depicted. It is the computer screen that is presented to the audience. This adds ambivalence to the technology making it challenging to actually describe it in terms of diegetic prototypes. One reason is the property of the depiction: its ambivalence and lack of the "concrete" prototype. What gets promoted by CAST, after all, is not one specific technological device. Rather, the technology that is promoted by CAST is a conceptual technology, not its concrete formation: Ambient Assisted Living. I have described and introduced Ambient Assisted Living early in this contribution – and already there I discussed it rather as a technological concept, an umbrella term that builds on basic features, then referring to concrete technologies (which got rather mentioned as illustrative examples for how this concept gets technologically realized). These key-features can very well be retraced in the videos, mainly in the notion of big data. Sun et al (2009) suggest a conceptualization that is well rehearsed in CAST's videos, as they establish:

> "The most important asset integrated in our community is indeed the people themselves. Our proposed community allows disparate technologies and people working together to help people who suffer from aging or disabilities. People who are able to provide services are encouraged to do so and assist the requesting people as informal caregivers. Elderly people are also encouraged to participate in the group activities, which not only helps to maintain physical and psychological health but also reduces the requests of professional medical resources. Professional caregivers (such as doctors, specialists etc.) are included in the community to provide emergency and professional medical service. Commercial vendors are also included, which brings convenience to the user and diversifies the service type, at the same time laying the foundation for economical exploitation and self- sustainability" (Sun et al., 2009, 1205).

They then substantiate this image of AAL with an actual image, a figure on the same page that is ought to illustrate how AAL should be conceptualized. Here we not only find the reason for the

lack of more concrete technological representations: AAL is a concept. And, as we find it in Sun et al.'s contribution, it is one that is very much focused on the body, as well: Elderlies are encouraged to participate, they explain, as it "helps to maintain physical and psychological health [and] also reduces the request of professional medical resources". This is the same argumentation we find in the videos. This accounts also for the positioning of other actors. Interestingly, these actors are the same we encountered above in the videos. This indicates a shared theme that is regularly rehearsed in (re-)presentations of AAL: its complexity and character as a conceptual umbrella-term, on the one hand, and its grounding in a specific, here already elaborated, narrative of greying societies. This then explains the vagueness of the diegetic prototype we encounter in the videos: it is one of an concept, a technological approach, not of a specific device. It facilitates a need for the concept of Ambient Assisted Living, provides even some examples for how it may be realized, and uses mainly a big-data-notion that is immanent in many AAL-representations. The statement found in Cook et al. is one of the best illustrations for this (self-)understanding: 'The most profound technologies are those that disappear. They weave themselves into the fabric of everyday life until they are indistinguishable from it" (Cook et al, 2009, 279).

The establishment of AAL as OPP then sits well in-line with Kirby's diegetic prototype. Yet, CAST does not rest upon its achievement of AAL as diegetic prototype. Rather this is but one part of this future-vision. As Borup et al. explain in the passage quoted above, futures act first of all as co-ordination device, as the expectations that get established "guide activities, provide structure and legitimation, attract interest and foster investment. They give definition to roles, clarify duties, offer some shared shape of what to expect and how to prepare for opportunities and risks" (Borup et al., 2006, 285). This perspective can also be taken upon the videos, and the analysis in Callon's terms, as provided above, makes this visible. I already explained how the re-specification of actors definitions and their alignment towards AAL as OPP feeds into it. Yet, this alignment can also be understood as a coordination device that assigns roles, prepares investment and legitimizes action. Three means can be observed for achieving this: The present-challenges, the future-solutions and the interdefinition of actors.

These three dimensions are strongly interconnected: The performance of a challenging present calls for action, identifies and locates problems that are presented as needed to be worked on, and positions the actors involved in either being part of the problem or the potential solution (or both). The establishment of the future is mostly opposed to the present, at least in the depictions of CAST, and serves as a) substantiating the aim of the coordinated action to overcome the present states (in this case the improvement of care) by b) establishing a (sociotechnical) future (i.e. Ambient Assisted Living). And the alignment of actors in the videos then serves as positioning them towards the shared aim. Of course this does not stand for the actual realization of CAST's promoted videos: There is now information available at this point on how CAST's efforts to promote Ambient Assisted Living played out – or rather: what role the videos played in

this in the end. Yet, it allows insights in how CAST a) conceptualizes future caring in terms of AAL and b) what it perceives as key actors for establishing this future and how it interrelates them.

CAST, itself a central player in the development of AAL systems, has here a strong technology-focused perspective, i.e. a position towards AAL and its social organization that is characterizes in a strong trust in technological solutions and a "technical" understanding of techno-social associations: This becomes visible for example in the compliant framing of actors or the focus on purely technological solutions. To show actors compliant with technology, of course, is also necessary to establish the technology as working. Yet, they are also assessed as compliant-to-technology in other terms: One is, for example, the body: It is assessed in a purely medical/physiological notion, feeding also into how care gets conceptualized and into how technologies get introduced in care-settings by focusing on the body. This is a rehearsal of what e.g. Sun et al. have to say on developing AAL as a concept that also involves an "active human dimension", yet only in terms of supporting technology in mainly medical terms. Thus, although included in its conception, "the social" remains "flat" and one-dimensional.

For CAST's future-vision this also means that clear-cut roles can be established, supporting the rather medical, body-centred understanding of care that is continued in its technological translation and its socio-technical support system (alias the "care network"). These roles are aligned towards supporting AAL – and CAST is one important provider for such technologies, embedded in a large organization that sits on the interface between care service providers, governmental bodies and those seeking services of care providers. In this, we finally find an absent character in the videos: The technology developer that is ought to provide the solution after all: It rests in CAST in a double role, as it – I have discussed this earlier (cp. Chapter 6) – not only is a representative primarily of care service providers, being part of LeadingAge, but also is itself leading the "charge to expedite the development, evaluation and adoption of emerging technologies"[39]. CAST is finally established as central actor, in establishing technologies as solution: It provides access to technologies as well as the care-network it promotes (as its own quasi-product), and is capable doing so as it not only itself is a crucial actor in research and development of AAL technologies but has the support of the strong infrastructures of LeadingAge granting access to its main clients: care service providers. This then also explains why medical experts and care professionals are put in a strong position in the videos, as they are the central clients of LeadingAge. To clarify the position of CAST in the videos and its relation to the future, I will now turn to some central aspect of the co-production of social and technological orders: namely those of CAST as a social actor and the videos as a technology for making this future.

[39] http://www.leadingage.org/CAST.aspx

Conclusions

UNVORSSEEN COSTS OF ACCEPTING THE FUTURE?

A strong future-oriented discourse gets utilized for framing AAL, yet we only recently started to understand its organization and political dimensions. This study lays a strong focus on the visual and rhetoric repertoires for establishing CAST's vision: by asking for the means for making "the future" and seeking to understand these futures as means. On the case of CAST's corporate videos I asked this question: How are social and knowledge orders co-produced in making the future?

I carved out the social orders that subsume the staging of the presents and futures of late life (Chapter 7), AAL-technologies (Chapter 8) and care in its organization and practice (Chapter 9). Thereby I elaborated on how these representations are utilized to establish a deficit model of late life to problematize the present and overcome it through a future-technological fix. I described how CAST orchestrates its envision of its futures to establish its fix as OPP and itself as central actor for achieving it and aligned other actors accordingly (Chapter 10). CAST's utilizes its futures as political ordering-device, mobilizing social norms and values and arranges them for framing different aspects of these futures (such as late life, care, technologies, and different actors). In the end the future emerges from co-produced social and technological orders: It builds on them just as much as it interprets, re-arranges and orchestrates them.

Deficits and Fix (Futures)

The future appears as promising, also beyond the initial vision of CAST: It is an open opportunity-space that promises improvement. This promise is articulated in more general terms by Adams & Groves, as they explain:

> "In contemporary industrialised societies, the future is represented as an empty space into which we move unhindered, its vacancy allowing us the freedom to transform and improve our lives. This understanding of the future is not just a mental image, however. It informs and drives all kinds of social practice, constituting a basic habit of mind through which complex social activities can be coordinated" (Adams & Groves, 2007, 57).

It is this promise of brighter futures that is an important driver for science and technology: STS makes a strong case in point for how "the future" serves as key vehicle in inspiring technological and scientific progress and also debunked the political act that future-making is. Accordingly there is a growing academic interest in unmasking the efforts that run into the framing and taming of futures for ones purposes. As Brown and al. explain:

> „The purpose of this analysis is not the future *per se*, but the 'real-time' activities of actors utilising a range of differing resources with which to create 'direction' or convince others of 'what the future will bring'. As such, our purpose is to shift the discussion from *looking into* the future to *looking at* how futures as temporal abstraction is constructed and managed, by whom and under what conditions" (Brown et al., 2000, 4).

As the future looses its innocence, the present does so as well. For taming the future, CAST predominantly invests in re-specifications of the present. To make a convincing argument for the fix, attention is directed towards everything that appears (or rather: is made to appear) to be wrong in the here and now. As soon as we find the confidence in our current course of action to be destroyed, the resulting outcry for action and solutions is easier to be addressed. Although an emphasis is placed on shaping the future, Adams and Groves (2007, 12) point out that "[a]t the same time, it retains the notion that there exists something which is to be transformed" (Ibid.). Making the future appears less an endeavor into what there is to come and how to achieve it. It rather is preoccupied with permeating the problematization of the present. How can we then be surprised to be confronted with the seemingly exaggerated efforts CAST puts into the problematization of the present? The predominance of the deficit model of late life with all its implications for the molding of technological devices and the organization of care is the pinnacle of these efforts. Once it is achieved it is only a small step to argue for its technological fix.

The visual and the verbal within the videos take distinct positions in problematizing the present. Whereas the verbal is reserved to explaining the abstract ramifications of more systematic challenges, the visual takes an individualized account. The latter is focused on the stories of Alma and Ernesto and depicts their incapacities and individualized challenges. The rhetorical parts of the videos (narrations and accounts of actors shown in interview-like settings) relate the visualizations to structural inefficiencies that frame "the present" as unbearable and highly problematic: They then describe the obstacles and risks of traditional care, explain medical conditions and the inefficiencies and redundancies of care infrastructures. This division of individualized and systematic takes allows the videos to problematize "the present" simultaneously on societal scales and individualized: Rhetoric and verbal accounts offer an abstract, infrastructural and wider societal problematization (relating to the care crisis, aging societies and redundant and inefficient infrastructures). Visual depictions translate these challenges to individualized accounts on Ernesto and Alma and achieve a narration that connects the audience to the personalized stories about Alma and Ernesto.

A large corpus of STS research suggests understanding futures as coordination device, constructed as to deliberately offer new coordinates for our societal travels. Yet, the question remains: How are those coordinates accepted as new course of action. In CAST's videos the solution may be found in the future, but the problems are located in the present. The visual and verbal repertoires offer a new course of action; they suggest new coordinates as travel destination. Yet, these coordinates are part of a correction of our present course - one that is constructed as unsafe. Thus justifying the future is achieved via the problematization of the present. We are ready to adjust our course only if we are *made* to realize (and convinced of) our current route to be unsafe.

Actor-Reconfigurations

> "Of particular importance in all these studies are the explicit or implicit actor roles embedded in expectations. Ideal expectations of future users and their attributes are literally and materially scripted into technologies and socio-technical systems, though these will inevitably be reinterpreted and even subverted in usage" (Borup et al, 2006, 288).

This fundamental conclusion of Borup et al. points to CAST's power in negotiating and prescribing user-roles. I discussed in Chapter 10 the interdefinition of different actors and concluded on the dominance of a perception of elderlies in passive roles that stage them in dependencies. Although also Borup et al. acknowledge that the configurations of actors "will inevitably be reinterpreted and even subverted in usage", at this point the power that rests in such inscriptions needs to be acknowledged. When buying into the solution CAST offers, one also ends up with the potentially unforeseen consequences of this promise. And these consequences can be severe, as they are built on the deficit logic of late life: Following how the different actors are configured (Chapter 10), CAST's technological fix reinforces a one-sided relationship of care through the configurations' inscription. It assumes elderlies as passive consumers of care services and assigns authority and agency to medical experts[40]. Particularly the configurations of a) elderlies in their passive roles, b) medical experts and technological devices as authoritarian agents of care result in the establishment of the hegemony of adulthood where elderlies end up having little control over their (medical) treatment and care. Thereby the inscriptions into the technological fix make care-relationships durable.

In its consequence, CAST's future strengthens the hegemony of adulthood[41] and consolidates elderlies' dependencies. This technologically materialized logic of care is strongly criticized and settles the positioning of elderlies at the rim of society: doomed to remain silent at their homes[42] and any convolution is perceived as becoming a burden to (adult) others. We thus need to carefully re-examine the configurations of actors, and particularly the relationships of care, that get inscribed and black-boxed in futures of AAL. This does not only account for this particular case, but for the visions that frame AAL more broadly: Particularly the applied conception of "autonomy" appears to rehearse unilateral power-relationships and to foster highly problematic care-relationships. Representations of late life in the deficit logic appear particularly drastic in this respect. Foremost, as they are black-boxed in the design of the socio-technical worlds AAL encompasses - and thus hardly accessible, once accepted.

Standardization and Normalization

Particularly severe consequences of such inscriptions materialize in the tendencies to standardization that are implied in CAST's technological fix. The built-in thresholds and standards manifest what gets continuously rehearsed in the roles assigned to the different actors

[40] as elaborated in more detail in Chapter 8
[41] as discussed in terms of second childhood and the mask of aging
[42] strongly re-inforced through the notion of autonomy, as discussed earlier

partaking in care. As Latour (1990) pointed to technology being society made durable, fostering the roles in their inscription must be without ambiguity taken as one of the most problematic aspect of CAST's futures.

The tendencies of standardization are encompassed in the quantification-processes described earlier (Chapter 8). Through their translation into technical thresholds, normal-values and standard deviations that measure and surveil embodied risks, underpinned assumptions about actors identities and properties end up in the devices' black-boxes. The definition of thresholds, for example, builds on a medical understanding of late life and encompasses strongly normalizing effects: Once it gets defined what "good aging", "being healthy", or a "successful late life" could mean, it is translated into metrical markers and indicators. Normative assumptions get inscribed in the technological setup and are made durable in its algorithms: Code becomes a social norm. Once black-boxed it is increasingly difficult to re-negotiate and escape these assumptions. This study unmasked them as reducing late life to medical parameters with sever consequences for the position of elderlies, also discussed in the section above.

> „Uncertainty, people at work, decisions, competition, controversies are what one gets when making a flashback from certain, cold, unproblematic black boxes to their recent past. If you take two pictures, one of the black boxes and the other of the open controversies, they are utterly different. They are as different as the two sides, one lively, the other severe, of a two-faced Janus. 'Science in the making' on the right side, 'all made science' or 'ready made science' on the other; such is Janus *bifrons,* the first character that greets us at the beginning of our journey" (Latour, 1987, 4).

It is thus important to carefully investigate what gets inscribed into the black-box, as its later opening may not be possible. Standardization seeks to fit the deficit model onto the perception of elderlies bodies as embodied risks: Once translated into the medical, normative metrics, these metrics not only incorporate the normative assumptions, but they enacted them forcefully: Thresholds are not to be exceeded; standards and norms are to be met. The unforgiving and omnipresent technological eye identifies every deviation and documents progress and digression over time. Deviations are inexorable detected and interventions provide adjustments and corrections. As such, standardization appears to reinforce the loss of agency of elderlies over their own bodies. The machine puts them right back into the place they belong: and this is to remain uncomplicated entities with bodies that must not act up; that must not deviate. The hegemonic power of adjustment remains with the medical expert. The configurations of actors are inscripted and black-boxed. They are made durable. And the translation of these configurations into normal values, thresholds, and metrics become inescapable once the quantification is automated and embodied in the machine's code. The discipline is built into the technology.

Morals

Everything rests on the compliant user. This is one key observation of this study that has not been elaborated on yet. Elderlies, medical experts, relatives, and caregivers – they all follow the regime of the technology. To resist the disciplining power of the technology equates with resistance to the vision of the future - as the whole thing breaks down. As such, particularly elderlies must comply

the expectations that are enforced upon them: To follow the advice of their devices, and of the medical experts that enact them. Yet, resistance is difficult, as every deviation is visible and can be traced. The omnipresent eye of the technology sees everything. Thus, CAST's vision of its technological future shows strong morals that are almost inescapable. I have touched upon them: These morals mainly derive from medical and neoliberal ideologies: The former is encompassed by the strongly medicalized discourse of the deficit model. To buy into the future promises of CAST implicates accepting crucial moral dimensions that shape care in one-sided relationships and foster a strongly medical and standardized conception of "good life". Yet, this medicalized discourse also feeds into the creation of a new market - that of medical technologies (AAL) and the provision of professional care services: The latter culminates in shifting tasks of care from public responsibilities ("keeping elderlies at their homes") to corporate care service providers: Elderlies, instead of causing increased governmental spending are introduced into a newly emerging market: that of AAL-technologies. The "relief" of informal caregivers from their burden must then be understood as making unpaid workforce obsolete, favoring the (paid for) services of the companies CAST represents.

What remains from the future?

So what remains from the future, given this perspective? It turns out to be problematic, at the least. CAST's vision builds on unsettling present states, framing them as highly problematic and particularly constructs late life in deficit terms. Instead of investing in a bright future, large efforts feed into de-constructing and shattering the present. CAST's future-technological fix not only builds on present challenges, but also constitutes them in the first place. This is utilized to transform the organization of care form a public responsibility to a neoliberal, market-driven ideology.

The technological fix heavily relies on the deficit perception of late life, as it promotes its fix through quantification and standardization, focused on risks embodied by elderlies: Inscribed is a hegemonic relationship of care that assigns authority to professional and medical service providers and demands elderlies to take over a strikingly passive role. The normative assumptions and morals incorporated by this fix become dangerous as they are black-boxed in thresholds, standards and normal values - and become increasingly inaccessible. The overarching ideologies and morals that stand behind them become durable as they manifest in the technologies. Given this tendency to conceal its normativity, we need careful reflection upon what gets inscribed into the futures of Ambient Assisted Living, who is making it, on what terms and to what ends. We need to be aware of the ideologies, morals and normative judgments that are built into the future and are constituted in the destruction of the present. In the end, we need to ask ourselves: Can we accept the normative and moral implications of the futures we choose to aspire?

Bibliography

AAHSA (2006). *Imagine: The future of Aging. Video Discussion Guide*. Washington: AAHSA. Retrieved from: http://www.leadingage.org/uploadedFiles/Content/About/CAST/About_CAST/Vision_Video_%20Guide.pdf

Adams, B., & Groves, C. (Eds.) (2007). *Future matters: Action, Knowledge, Ethics*. Leiden: Brill.

Akrich, M. (1992). The De-Scription of Technical Objects. In W. Bijker & J. Law (Eds.) *Shaping technology/building society. Studies in Sociotechnical Change* (205-224). Cambridge, MIT-Press.

Akrich, M., & Latour, B. (1992). A summary of a convenient vocabulary for the semiotic of human and nonhuman assemblies. In W. Bijker & J. Law (Eds.) *Shaping technology/building society. Studies in sociotechnical change* (259-265). Cambridge, MIT-Press.

Bachinger, L., & Fuchs, W. (2013). Rechtliche Herausforderungen des Technikeinsatzes in der Altenpflege. Eine rechtssoziologische Perspektive auf Ambient Assisted Living. *SWS Rundschau, 53*(1), 73-94.

Baldwin, C. (2005). Technology, dementia and ethics: Rethinking the issues. *Disability studies quarterly*, *25*(3).

Bateson, G., & Mead, M. (1942). Balinese character. A photographic analysis. *New York*, 17-92.

Bauman, Z. (2000). Liquid Modernity. Cambridge, Malden: Polity Press/Blackwell.

Belbachir, A. N., Drobics, M., & Marschitz, W. (2010). Ambient Assisted Living for ageing well – an overview. E & I Elektrotechnik Und Informationstechnik, 127(7-8), 200–205.

Bell, P., & Milic, M. (2002). Goffman's Gender Advertisements revisited: Combining content analysis with semiotic analysis. *Visual Communication*, *1*(2), 203-222.

Berendt, B. (2015). Big capta, bad science? On two recent books on "Big Data" and its revolutionary potential. Extended version of book review to appear in Karakter.

Berkhout, F. (2006). Normative expectations in systems innovation. *Technology Analysis & Strategic Management, 18*(3-4), 299-311.

Borup, M., & Brown, N. (2006). The Sociology of Expectations in Science and Technology. *Technology Analysis & Strategic Management*, *18*(3-4), 285–298.

Boyd, D., & Crawford, K. (2012). Critical questions for big data: Provocations for a cultural, technological, and scholarly phenomenon. *Information, communication & society*, *15*(5), 662-679.

Brown, N. (2003). Hope against hype: Accountability in biopasts, presents and futures. *Science Studies, 16*(2), 3-21.

Brown, N. (2006). Shifting tenses: From ‚regimes of truth' to ‚regimes of hope'. *SATSU Working Paper*. New York.

Brown, N., & Michael, M. (2003). A Sociology of Expectations. Retrospecting Prosepcts and Prospecting Retrospects. *Technology Analysis and Strategic Management, 15*(1), 3 – 18.

Brown, N., Rappert, B., Webster, A. (2000). *Contested Futures. A sociology of prospective techno-science*. Aldershot, Burlington, Singapore, Sydney: Ashgate.

Callon, M. (1986). Some elements of a sociology of translation: Domestication of the scallops and the fishermen of St. Brieuc Bay. *Power, action, and belief: A new sociology of knowledge*, *32*, 196-223.

Chandler, D. (2007). Semiotics. The Basics (2nd Edition). New York: Routledge.

Cook, D. J., Augusto, J. C., & Jakkula, V. R. (2009). Ambient intelligence: Technologies, applications, and opportunities. *Pervasive and Mobile Computing*, *5*(4), 277-298.

Czarniawska, B. (2004 [2013]). Narratives in Social Science Research. London, Thousand Oaks, New Delhi: Sage.

Deuten, J. J., & Rip, A. (2000). The Narrative Shaping of a Producte Creation Process. In Brown et al (Eds.) *Contested Futures. A sociology of prospective techno-science* (pp. 65-86). Aldershot, Burlington, Singapore, Sydney: Ashgate.

Diprose, R., Stephenson, N., Mills, C., Race, K., & Hawkins, G. (2008). Governing the future: The paradigm of prudence in political technologies of risk managament.

Durant, J., Evans, G., & Thomas, G. P. (1989). The Public Understanding of Science. *Nature*, *340*, 11-14.

Eaton, S. C. (2005). Eldercare in the United States: Inadequate, inequitable, but not a lost cause. *Feminist Economics*, *11*(2), 37-51.

Federici, S. (2012). On elder care. *The Commoner*, *15*, 235-261.

Felt, U. (2013a). Keeping technologies out: Sociotechnical imaginaries and the formation of a national technopolitical identity. Manuscript: http://sciencestudies.univie.ac.at/publikationen/

Felt, U., Barben, D., Irwin, A., Joly, P.-B., Rip, A., Stirling, A., & Stöckelová, T. (2013). Science in Society: Caring for Our Futures in Turbulent Times. *Policy Briefing, 50*, Strasbourg: ESF.

Flick, U. (2009). An Introduction to Qualitative Research (Fourth Edition). London, Thousand Oaks, New Dehli, Singapure: Sage.

Felt, U. (2014). Within, Across and Beyond – Reconsidering the Role of Social Sciences and Humanities in Europe. *Science as Culture, 23*(3)*,* 384-396.

Featherstone, M., & Wernick, A. (Eds.). (2003). *Images of aging: Cultural representations of later life*. Routledge.

Foster, L., & Walker, A. (2014). Active and Successful Aging: A European Policy Perspective. *The Gerontologist*, gnu028. DoI: 10.1093/geront/gnu028

Geels, F. W., & Smit, W. A. (2000). Failed technology futures. Pitfalls and lessions from a histrical survey. Futures, 32, 867-885.

Glaser, B. G., & Strauss, A. L. (2009). *The discovery of grounded theory: Strategies for qualitative research*. Transaction Publishers.

Godin, B. (2006). The Linear model of innovation the historical construction of an analytical framework. *Science, Technology & Human Values*, *31*(6), 639-667.

Goodwin, C. (1994). Professional vision. *American anthropologist*, *96*(3), 606-633.

Goffman, E. (1987). Gender advertisements. New York: Harper Row.

Hall, J. R., Becker, L. T., & Stimson, B. (Eds.) (2006). Visual Worlds. New York and London: Routledge.

Harper, D. (1988). Visual sociology: Expanding sociological vision. *American Sociologist* 19: 54–70.

Hazan, H. (1994). *Old age: Constructions and deconstructions*. Cambridge University Press.

Hockey, J., & Allison, J. (2003). Back to our Futures: Imagining second childhood. In M. Featherstone & A. Wernick (Eds.) *Images of Aging*. *Cultural Representations of Later Life* (133 – 148). Routledge: London & New York.

Hodgetts, D., Chamberlain, K., & Bassett, G. (2003). Between television and the audience: Negotiating representations of ageing. *Health:*, *7*(4), 417-438.

Jasanoff, S. (forthcoming). Future Imperfect. Science, Technology, and the Imaginations of Modernity. Preprint, 1-47.

Jasanoff, Sheila. "Image and imagination: the formation of global environmental consciousness." *Changing the atmosphere: Expert knowledge and environmental governance* (2001): 309-337. Retrieved from: http://belfercenter.ksg.harvard.edu/files/imagination.rev.pdf

Jasanoff, S. (2004). The Idiom of Co-Production. In S. Jasanoff (Ed.) States of Knowledge. The Co-Production of Science and Social Order (pp. 1-12). London: Routledge.

Jasanoff, S. (2004a). Heaven and Earth: The Politics of Environmental Images. In S. Jasanoff & M. Long-Martello (Eds.), *Earthly Politics: Local and Global in Environmental Governance* (pp. 31–52). Cambridge: MIT Press.

Jasanoff, S. (2010). A New Climate for Society. Theory, Culutre & Society, 27(2-3), 233-253.

Jasanoff, S., & Kim, S.-H. (2009). Containing the Atom: Sociotechnical Imaginaries and Nuclear Power in the U.S. and South Korea, Minerva, 47(2), 119-146.

Kandel, J., & Adamec, C. A. (2009). *The encyclopedia of elder care*. Infobase Publishing.

Katz, S., & Calasanti, T. (2014). Critical perspectives on successful aging: Does it "appeal more than it illuminates"?. *The Gerontologist*, gnu027.

Kavanagh, A. M., & Broom, D. H. (1998). Embodied Risk: My Body, Myself? *Social Science & Medicine, 46*(3), 437-444.

Keating, N. C., Fast, J. E., Connidis, I. A., Penning, M., & Keefe, J. (1997). Bridging Policy and Research in Eldercare. *Canadian Public Policy, 23*(Spring), 22-41.

Kirby, D. (2009). The future is now: Diegetic prototypes and the role of popular films in generating real-world technological development. Social Studies of Science.

Konrad, K. (2006). The social dynamics of expectations: The interaction of collective and actor-specific expectations on electronic commerce and interactive television. Technology Analysis & Strategic Management, 18(3-4), 429-444.

Knoblauch, H., Schnettler, B., Raab, J., & Soeffner, H. G. (Eds.) (2006). Video Analysis: Methodology and Methods: Qualitative Audiovisual Data Analysis in Sociology. Frankfurt am Main: Peter Lang.

Kress, G., & van Leeuwen, T. (2006). Reading Images. The Grammar of Visual Design (second edition). London, New York: Routledge.et

Latour, B., Hermant, E., & Shannon, S. (1998). Paris ville invisible.

Latour, B. (1990). Technology is society made durable. *The Sociological Review*, *38*(S1), 103-131.

Latour, B. (1993). We have never been modern. Harvard Unversity Press.

LeadingAge (n.d.). *Strategic Plan 2014-2018*. Retrieved from: http://www.leadingage.org/uploadedFiles/Content/About_Us/LeadingAge%20Strategic%20PlanFOR%20WEB.pdf

LeadingAge (n.d.-b). *Leadership Imperatives. A transformational Agenda*. Retrieved from: http://www.leadingage.org/uploadedFiles/Content/About/About_LeadingAge/Leadership_Imperatives_2013_WEB.pdf

LeadingAge (n.d.) Members [Website]. Retrieved from: http://www.leadingage.org/Members.aspx

LeadingAge Cast (n.d.b) Center for Aging Services Technologies [Website]. Retrieved from: www.leadingage.org/CAST.aspx

LeadingAge Cast (2005). *Imagine – The Future of Aging* [Video file]. Retrieved from http://www.leadingage.org/Imagine-the-Future-of-Aging.aspx

LeadingAge Cast (2011). Imagine: the Future of Aging [Website – Entery]. Retrieved from http://www.leadingage.org/Imagine-the-Future-of-Aging.aspx

LeadingAge Cast (2012a). *High Tech Aging: Improving Lives Today* [Video file]. Retrieved from http://www.leadingage.org/high-tech/

LeadingAge Cast (2012b). Hight-Tech ging: Improving Lives Today [Website – Entery]. Retrieved from: www.leadingage.org/high-tech

LeadingAge CAST (2011, April 29). Imagine: the Future of Aging [Website]. Retrieved from: http://www.leadingage.org/Imagine-the-Future-of-Aging.aspx

LeadingAge CAST (2012, December 19 [Updated 2013, April 3]). High Tech Aging. Improving Lives Today [Website]. Retrieved from: http://www.leadingage.org/high-tech/

LeadingAge (2013a). Annual Report 2013: LeadingAge 2013 Accomplishments. Retrieved from: http://www.leadingage.org/2013accomplishments.aspx

Lerner, G. F. (2007, September). Visconti's SENSO: The Art of History. In *Forum Italicum: A Journal of Italian Studies* (Vol. 41, No. 2, pp. 342-358). SAGE Publications.

Levande, D. I., Herrick, J. M., & Sung, K.-T. (2000). Eldercare in the United States and South Korea. Balancing Family and Community Support. *Journal of Family Issues, 21*(5), 632-651.

Long, S. (Ed.) (2014 [2000]). *Caring fort he Elderly in Japan and the U.S.. Practices and Policies*. Routledge: London.

Lösch, A. (2006). Anticipating the futures of nanotechnology: Visionary images as means of communication. Technology Analysis & Strategic Management, 18(3-4), 393-409.

Luhmann, N. (1976). The future cannot begin. Temporal structures in modern society. Social Research, 43(1), 130-152.

Lupton, D. (1993). Risk as moral danger: the social and political functions of risk discourse in public health, *International Journal of Health Services, 23*, 425-35.

Lupton, D. (1999). *Risk (Key Ideas)*. New York: Routledge.

Macnamara, J. (2005). Media content analysis: Its uses, benefits and Best Practice Methodology. *Asia Pacific Public Relations Journal, 6*(1), 1-34.

Marek, K. D., & Rantz, M. J. (2000). Aging in Place: A New Model for Long-Term Care. *Nursing administration quarterly*, *24*(3), 1-11.

Mayring, P. (2000). Qualitative Content Analysis. *FQS, 1*(2).

Miller, S. (2001). Public understanding of science at the crossroads. *Public Understanding of science*, *10*(1), 115-120.

Minnix, L. (2014). 2013 Annual Report: Letter from the CEO [Website]. Retrieved from: http://www.leadingage.org/2013_annual_report_letter_from_ceo.aspx

Mol, A. (2008). The logic of care. *Health and the problem of Patient Choice*. Routledge: London and New York.

Mol, A., Moser, I., & Pols, J. (2010). Care: putting practice into theory. In A. Mol et al. (Eds.) *Care in Practice. On tinkering in Clinics, Homes and Farms* [7-25]. Bielefeld: Transcript.

Mort, M., Roberts, C., & Callén, B. (2013). Ageing with telecare: care or coercion in austerity? Sociology of Health & Illness, 35(6), 799–812.

Newbold, C., Boyd-Barret, O., & Van Den Bluck, H. (2002). The media book. London: Arnold.

Nisbet, M., & Mooney, C. (2007). Framing Science. *Science, 316*, 1167-1170.

Neven, L. (2011). Representations of the Old and Ageing in the Desgin of the New and Emerging. Assessing the design of Ambient Intelligence technologies for older people [Dissertation]. Ipskamp Drukkers BV: Enschede.

Pickart, S. (2009). Governing Old Age: The 'Case Managed' Older Person. *Sociology, 43*(1), 67-84.

Pieper, M., Antona, M., & Cortés, U. (2011). Introduction to the Special Theme. Ambient Assisted Living. ECRIM NEWS, 87, 18-19.

Pink, S. (2001). Doing Visual Ethnography. London, Thousand Oaks, New Dehli, Singapure: Sage.

Powell, J. L. (2006). *Social theory and aging*. Rowman & Littlefield.

Rashidi, P., & Mihailidis, A. (2013). A survey on ambient-assisted living tools for older adults. *IEEE journal of biomedical and health informatics*, *17*(3), 579-590.

Reichertz, J., & Englert, C. J. (2011). Einführung in die qualitative Videoanalyse. Eine hermeneutisch-wissenssoziologische Fallanalyse. Wiesbaden: VS Verlag für Sozialwissenschaften.

Remmers, H. (2010). Environments for ageing, assistive technology and self-determination: ethical perspectives. *Informatics for Health and Social Care*, *35*(3-4), 200-210.

Roberts, C., & Mort, M. (2009). Reshaping what counts as care: Older people, work and new technologies. ALTER - European Journal of Disability Research / Revue Européenne de Recherche Sur Le Handicap, 3(2), 138–158.

Rosner, L. (Ed.). (2013). Introduction. In *The technological fix: how people use technology to create and solve problems* [1-10]. Routledge.

Schmidt, S., Shelley, M., Bardes, B., & Ford, L. (2013). *American Government and Politics Today, No Separate Policy Chapters Version, 2013-2014*. Cengage Learning.

Shapin, S. (1990). Science and the Public. In R. C. Olby, G. N. Cnator, J. R. R. Christie & M. J. S. Hodge (Eds.). *Companion to the History of Modern Science* (pp. 990-1007). London: Routledge.

Silverman, D. (2006a). Interpreting Qualitative Data (Third Edition). London, Thousand Oaks, New Dehli, Singapure: Sage.

Silverman, D. (Ed.) (2006b). Qulaitative Research (Third Edition). London, Thousand Oaks, New Dehli, Singapure: Sage.

Suchman, L., Trigg R.H. (1991). Understanding practice: Video as a medium for reflection and design. In: Greenbaum J, Kyng M (Eds.) *Design at Work: Cooperative Design of Computer Systems* [65-89]. Hillsdale: Lawrence Erlbaum.

Sun, H., De Florio, V., Gui, N., & Blondia, C. (2009, April). Promises and challenges of ambient assisted living systems. In *Information Technology: New Generations, 2009. ITNG'09. Sixth International Conference on* (pp. 1201-1207). Ieee.

Takács, B., Hanák, D. (2007). A Mobile System For Assisted Living With Ambient Fa-cial Interfaces. IADIS International Journal on Computer Science and Information Systems, 2(2), 33-50.

Timmermans, S., & Almeling, R. (2009). Objectification, standardization, and commodification in health care: a conceptual readjustment. *Social Science & Medicine*, *69*(1), 21-27.

Van Leeuwen, T., & Jewitt, C. (2001). The Handbook of Visual Analysis. London, Thousand Oaks, New Delhi: Sage.

Van Lente, H., & Rip, A. (1998). The Rise of Membrane Technology: From Rhetorics to Social Reality. Social Studies of Science, 28(2), 221-254.

Van Lente, H. (2000). Forceful Futures: From Promise to Requirement. In Brown et al (Eds.) Contested Futures. A sociology of prospective techno-science (pp. 43-64). Aldershot, Burlington, Singapore, Sydney: Ashgate.

Wagner, C. G. (2004). Futuring and Foresight. The Futurist, 28(3).

Walker, A. (2002). A strategy for active aging. *International Social Security Review, 55*(1), 121-139.

Walker, A. (2008). Commentary: The Emergence and Application of Active Aging in Europe. *Journal of Aging & Social Policy, 21*(1), 75-93.

Watts, L. (2008). The Future is boring. Stories form the landscape of the mobile telecoms industry. 21st Century Society: Journal oft he Academy of Social Sciences, 3(2), 187-198.

Winance, M. (2006). Trying Out the Wheelchair The Mutual Shaping of People and Devices through Adjustment. *Science, Technology & Human Values*, *31*(1), 52-72.

Woolgar, S. (1990). Configuring the user: the case of usability trials. *The Sociological Review, 38*(S1), 58-99.

World Health Organization. (2004). Active ageing: a policy framework. Geneva: WHO; 2002.

Wynne, B. (1992). Misunderstood Misunderstanding: Social Identities and Public Uptake of Science. *Public Understanding of Science, 1*(3), 281-304.

Zap□dowska-Kling, K. (2014). Eldercare services in Sweden and the United States– comparative perspective and examples of best practice. The Pozna□ University of Economics Review, 14(2), 31-42.

Zagler, W. L., Panek, P., & Rauhala, M. (2008). Ambient Assisted Living Systems-The Conflicts between Technology, Acceptance, Ethics and Privacy. Internat. Begegnungs-und Forschungszentrum für Informatik.

Zhang, Y., & Wildemuth, B. M. (2009). Qualitative analysis of content. *Applications of social research methods to questions in information and library science*, 308-319.

Zwijsen, S. A., Niemeijer, A. R., & Hertogh, C. M. (2011). Ethics of using assistive technology in the care for community-dwelling elderly people: An overview of the literature. *Aging & mental health*, *15*(4), 419-427.

Abstract (English)

"Ambient Assisted Living" (AAL) is the umbrella term for new technologies that are ought to assist and improve caring for elderlies. Advances in ICT, embedded computing or the "internet of things" (i.e. internet-based information architecture for the exchange of services or goods) are increasingly introduced in care settings, aiming to assist relatives and caregivers in their daily care-work, and to provide comfort, safety and security to elderlies. This is subordinate to the central maxim of AAL: To allow elderlies to live at their own homes - and on their own terms - for as long as possible and despite deteriorating health.

This promise is embedded in a wider societal discourse on "care crises" in context of changing demographics, where professional as well as informal caregivers, and the infrastructures that are ought to support them, face a variety of severe challenges. Ambient Assisted Living gets framed and promoted as solution to these challenges located in a near-future. "The Future", accordingly, takes a very particular part within the promotion of Ambient Assisted Living and also guides its development, facilitates investment and serves as vehicle for coordinated action. Yet, despite the undoubtedly crucial position of futures, we are only beginning to understand the processes that constitute "the future" of Ambient Assisted Living and the diverse consequences of its envisioning.

This study pays close attention to the making of AAL's futures on the case of two promotional videos, published by *LeadingAge CAST* in 2005 and 2012. Thereby it focuses on visual and rhetoric repertoires for establishing its distinct vision and asks for how AAL can be understood in terms of co-produced social and technological orders. Particular attention therefor is placed upon how CAST mobilizes interpretations and representations of techno-social worlds to facilitate a distinct framing of AAL. I suggest that for staging its future as bright, improved and wishful, CAST puts great efforts into problematizing present states. In the end, the present turns out to be the site of contesting and re-specifying morals, norms and virtues of "good life" and "responsible care". And its staging as *in deficit*, *challenging* and – in the end – *unbearable* only allows the establishment of AAL as future-technological fix it gets presented as.

When I ask for "how social and technological orders are co-produced in making the future of AAL", I therefor am interested in the staging of presents and futures, in the re-configurations of the various actors that get involved in (or excluded from) it, and the morals that are inscribed in the future-vision that CAST presents in its videos.

In the end, asking for the moralities of "the future", by encountering the sharp contrast of a technological fix with the efforts for construction of present problematization, then also leads one to pose the question to the reader: Is this future one we want (or can) accept?

Abstract (Deutsch)

"Ambient Assisted Living" (AAL) ist ein Überbegriff für eine Reihe technologischer Innovationen die unterstützend in Pflege- und Alterungsprozesse eingreifen sollen. Hier zeitigen vor allem neue Fortschritte in der Entwicklung von *ICT*, *embedded computing,* und dem *internet of things* (Internet-basierte informations-Architekturen die den Austausch von Services und Gütern erleichtern und vorantreiben) großes Potential Pflegelandschaften grundlegend zu verändern. Dabei ist der Begriff mit der Hoffnung verknüpft, Herausforderungen zu überwinden, die im Zusammenhang weitgehender sozio-demographischer Umwälzungen gestellt werden. Die Maxime, Ältere möglichst lange das Altern an dem von ihnen gewünschten Ort zu gewähren wird dann zum individualisierten Ausdruck des Bedarfs der Entlastung professioneller und institutioneller Pflege-Infrastrukturen.

Dieses Versprechen, das im weiteren gesellschaftlichen Diskurs zur „Pflegekrise" zu verorten ist, ist stark mit der Aussicht auf eine zunehmend düstere Zukunft verknüpft, die den Teufel der „Überalterung", des „Kollaps der Pflegesysteme" oder des „Pflegekräftemangels" an die Wand malt. AAL wird in dem Zusammenhang als vielversprechende Lösung verhandelt, als „technologischer Fix", und in eine nahe Zukunft verortet, an deren Realisierung es aktiv zu arbeiten gilt. Zukünfte nehmen damit einen spezifischen Part in der Rahmung von AAL ein und leiten dabei auch die Entwicklung, regen Investitionen an und dienen als Vehikel für koordinierte Zusammenarbeit. Trotz dieser offensichtlich zentralen Rolle, beginnen wir erst die Rolle und transformative Macht der Zukunft im Hinblick auf Ambient Assisted Living zu verstehen.

Zwei Werbevideos - von *LeadingAge CAST* 2005 sowie 2012 veröffentlicht - stehen im Mittelpunkt dieser Studie und dienen als konkreter Fall um die Rolle der „Zukunft" zu verstehen. Diese Studie widmet sich den visuellen und rhetorischen Repertoires, die genutzt werden um CASTs Zukunftsvision zu etablieren. Dabei stellt sich die Frage, inwieweit AAL als Produkt von Prozessen der Ko-Produktion sozialer und technologischer Ordnungen verstanden werden muss: Wie macht sich CAST Interpretationen und Rahmungen sozio-technischer Welten zu nutze, um ein spezifisches Verständnis von „der Zukunft" (und damit von AAL) zu erreichen? Um die Zukunft als vielversprechend und verbessert darzustellen – so das zentrale Argument – investiert CAST stark in die Konstruktion negativer, ja sogar dystopischer, Gegenwarts-Interpretationen. Schlussendlich erweist sich „die Gegenwart" als stark umkämpft: Als Ort der Problematisierung; an dem Moral, soziale Normen und Ideale ausgehandelt und uminterpretiert werden, um schlussendlich ein höchst negatives Bild gegenwärtiger Zustände zu erreichen. Diese Befunde ermöglichen erst die Etablierung einer „verbesserten" Zukunftsvision und gewähren die Positionierung von AAL als „technologischer Fix".

Die Frage: „Wie werden soziale und technologische Ordnungen in der Produktion von Zukünften ko-produziert“, stellt also die Positionierung von Zukunft und Gegenwart in den Mittelpunkt, sowie die Mittel zur Re-Konfiguration verschiedenster darin einbezogener (oder exkludierter) Akteure. Schlussendlich aber ist es vor Allem die Frage nach der Inskription und Re-Konfiguration sozialer Moralvorstellungen, die hier aufgeworfen wird. Und führt schlussendlich dazu, dass der Leser vor die Frage gestellt werden muss: Ist diese Zukunft, die CAST bewirbt, eine die wir akzeptieren wollen (oder gar können)?

CURRICULUM VITAE

Education

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Talks, Conferences, Activities

10/2014	TALK: INSIST-Nachwuchstagung (Graduate Network Conference), Berlin, Germany
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12/03/2014	Guest Lecturer, Carinthia University of Applied Sciences
09/2013	TALK: E.D.E. Congress 2013, Tallinn, Estonia
07/2012	Europ. Forum For Restorative Justice Conference, Helsinki, Finland
01/2012	Power of Information-Conference, Brussels, Belgium

Publications

Bachinger, L. M., & Fuchs, W. (2013). Rechtliche Herausforderungen des Technikeinsatzes in der Altenpflege. Eine rechtssoziologische Perspektive auf Ambient Assisted Living. SWS-Rundschau, 1(13), 73-94.

Bachinger, L., & Pelikan, C. (forthcoming, 2015). Victims' experiences in VOM in Austria: The 'real' story. Ivo Aertsen, Inge Vanfraechem, & Daniela Bolivar (Eds.) Victims and Restorative Justice. Routledge.