How robots challenge institutional practices

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ABSTRACT

In a globalized world, tools are not what they used to be. Artefacts are material and ideal, but they are often used by people other than those who made them, creating a culture-culture split. The person who creates an artefact perceives it in one way; whereas the people who use it learn how to perceive it in relation their own activity settings and local institutional practices. In this article, I draw on a recent study of the introduction of a robot helper into the activity setting of a Danish rehabilitation centre to examine this split and to identify the processes by which material artefacts may or may not become embedded within cultures. The study traced how the staff at the centre made efforts to find uses for the robot, but ultimately recognised that they needed to reject it, as the demands made by the technology prevented their pursuing what they saw as the primary purposes of the centre. The analyses of the processes in play during attempts at accommodating and then rejecting the robot were informed by Hedegaard's seminal framing of the relationships between activity settings with their histories and motives and the institutional practices within which they are located. The study ultimately concluded that overarching motives of the everyday work of the staff determined whether they included the material artefact, the robot, in their activities as meaningful, or excluded it as meaningless.

1. Introduction

In this contribution, I shall discuss Mariane Hedegaard's concept of 'institutional practice' and how it relates to my own work on learning in cultural ecologies where materiality is continuously in- and excluded from presence in socio-material environments. Like Mariane Hedegaard (2009) and Anne Edwards (2009) I reject a systems approach. Humans do not live in systems. We live and work through institutional practices with their own traditions and habits as well as the institutionalized interpretations of societal priorities (Fleer and Hedegaard, 2010). Machines and robots in particular, however, demand systems to function optimally. When such machines enter established institutional practices like a rehabilitation home, their very presence demand a more system-based environment. I shall discuss how staff in a specific Danish rehabilitation centre responds to the robot demands and how this may open up a new focus on the role played by materials in Hedegaard's models (e.g. Hedegaard, 2009:73).

In cultural-historical approaches materiality has always been of importance. Yet the importance of material presence and the role they play in concept formation has often been overlooked in studies of institutional practices. An attentive focus reveals that materials are not just aiding but are sometimes constitutive of new forms of word-meaning that in turn affect institutional practices. Hedegaard's work has focused on institutional practices and the activity settings where materials have been used in schools and homes to train children in specific abilities. Bringing the materials to the foreground emphasise that materials themselves are formative of cultural changes of traditions. Culture is not embedded directly in the materials that are used in the diverse activity settings (see Hedegaard this volume for a description of the diversity of activity settings). For materials to become culturally embedded a process of learning is needed that in some ways is open to material agency (Sørensen, 2009) as well as for humans striving to align

with this agency through new kinds of word-meaning.

2. Institutional practices with materials

We all struggle with how to deal with the complexity of everyday life and Hedegaard has provided new insights into studies of people's lived lives. One the one hand this life can be seen from the perspective of an individual person engaging in concrete activities like playing, reading, or doing 'things to things' at a very local level. On the other hand, these very mundane and embodied activities can be seen as local practices tied to a wider complex of institutions that influence what kind of activities go on within the particular institutional frame (in a school or a home or a rehabilitation centre). In Hedegaard's work the institutions seem to be a stabilizing factor with traditions tied to activity settings. An individual person moves between institutional practices and their traditions for certain activities (lunch at 12.00 every day or a walk every afternoon etc.). The institutional practices in one institution (like school) can influence the institutional practices of another and be the reason for upholding traditions like when parents set the alarm clock to ring every morning at 6.30 in their home because the children have to be at school at 8.00 am. Thus, the institutional practices entangle and influence each other – and humans adjust and arrange so that they can live acceptable lives; but they also need to develop their agendas when moving between institutions. This is of course the case for children moving between schools and homes, as argued frequently by Hedegaard (2008), but it is also the case for adult newcomers who often have to move into unknown institutional practices. I have argued that adult newcomers have to align with many new cultural demands when entering what I called cultural ecologies – and that ethnographers have the position as a newcomer as part of their professional practice (Hasse 2015). Cultural ecologies are a bit more vivid than the institutional practices proposed by Hedegaard, as I, in my analysis, have had a focus on in- and exclusions from institutions rather than on the traditions upholding the activity settings. What is in- or excluded can be words (as when you are not allowed to swear) or clothes (as when female physicists' students are expected to wear trousers and not miniskirts) or even people (who swear and wear miniskirts) – and there is always a pattern behind these in- and exclusions which make them predictable for the local expert learners (ibid.). However, whether the analytical gaze is on the socio-material disturbances and disruptive forces at play or how the same socio-material forces uphold tradition, what we are studying are not institutional systems but institutional practices.

Hedegaard explicitly rejects the view that an institutional practice should be analysed as a system. She refers to Bronfenbrenner (1979) who argued for a system approach to analysis of human cultural ecologies, where identification of interrelating systems is used to define each system. For Bronfenbrenner, we can identify developing ecologies as systems that are embedded in each other like Russian dolls (Bronfenbrenner, 1979: 3). He goes from a microsystem (which takes persons and their immediate institutional environment as a point of departure), over a mesosystem where the microsystems interact (as when a teacher from the microsystem 'school' contacts a parent in the microsystem 'home') to an exosystem and ultimately in a macrosystem. The exosystem influences the micro- and *meso* systems even if the individual never becomes aware of this influence – as when an event like a parent being fired from the microsystem 'workplace' influences the child in the microsystem 'home'. The final layer around all the internal interacting systems, the macrosystem, has no physical anchor in any institutional setting, but consists of cultural traditions, values and laws that influence all the way down through the systems to the individual. Thus, public laws and decrees would be placed in the macrosystem in this systematic understanding of how culture affects the lives of people in their everyday settings.

Bronfenbrenner in his systems approach identified the physical and material as placed in the settings of microsystems, and a setting is defined as:

> …a place where people can readily engage in face-to-face interaction - home, day care centre, playground, and so on. The factors of activity, role, and interpersonal relation constitute the elements, or building blocks, of the microsystem. A critical term in the definition of the microsystem is 'experienced'. The term is used to indicate that the scientifically relevant features of any environment include not only its objective properties but also the way in which these properties are perceived by the persons in that environment.
>
> (Bronfenbrenner, 1979, p. 22)

Thus, as emphasized by Hedegaard, in Bronfenbrenner's perspective individual persons are locked into these systems as passive recipients and she urges that we instead consider the cultural-historical approach, where persons are active contributors to their own institutional practices. Though these practices are to some extent provided by society, people also contribute to make changes in society through changes in their ongoing processes in practices.

> Personal activities are not systems but processes, and therefore they are not concrete manifestations of institutional practice; they are not inscribed into each other but influence each other dialectically. A person contributes to his own institutional conditions and the perspective of his society; therefore, institution and person both have to be conceptualized as contributing to practice in a theory of children's development.
>
> (Hedegaard, 2009, p. 65)

She further proposes, inspired by Vygotsky, that we therefore look at society, institutions and persons as three different perspectives on the same whole instead of using the systems approach taken by Bronfenbrenner. Hedegaard's approach makes it possible to look at how different traditional practices create different demands on people moving between institutions. She is employing this framework to study children's development. It can also be used to study changes and transformations of institutional practices. What I shall add to this perspective is an emphasis on how society, institutions and persons are not just linked through materials, but also how materials may affect and transform persons, institutional practices and in the end societies.

Though persons are by no means passive recipients of materials affecting their activity settings and institutional practices the materials are not just *tools* either. Materials are often perceived in cultural-historical analysis as tools that affect an environment, and as signs they also affect the psychological architecture of the persons using them. What they also affect, I shall argue, is institutional practices and traditions.

According to Michael Cole and Jan Derry (who both build on the Vygotskyan approach) artefacts have a dual nature. They write that artefacts are.

> …an aspect of the material world that has been modified over the history of its incorporation into goal directed human action. By virtue of the changes wrought in the processes of their creation and use, artifacts are simultaneously ideal (conceptual) and material. They are material in that they have been created by modifying physical material in the process of goal-directed human actions. They are ideal in that their material form has been shaped to fulfill the human intentions underpinning those earlier goals; these modified material forms exist in the present precisely because they successfully aided those human intentional goal-directed actions in the past, which is why they continue to be present for incorporation into human action.
>
> (Cole & Derry, 2005, p. 211–212)

In a globalized world tools are not what they used to be. Today it is necessary to specify that there is not a seamless connection between the dual natures of artefacts. The artefacts are material and ideal, yes, but they are most often not to be used by the people who made them. This is what creates a split – but not a Cartesian nature-culture split. It is rather a culture-culture split where the person who creates an artefact perceives it in one way; whereas the people who use it have to learn how to perceive it as tied to their own activity settings and local institutional practices. In a globalized world, our concern for changes of institutional practices is not confined to societies either. Neither is localized institutional practices embedded in each other when they produce materials. They rather work together across nation states and ethnic borders.

New technologies, such as robots, are comprised of components from many places and put to use a long way from where they were produced. These kinds of tools, are the result of goal-directed actions by some humans, who both in terms of goals and interests may be very far away from the institutional practices where the artefacts are put to use. When these globalized products meet a local institutional practice, both are likely to change – both as ideal manifestations and sometimes their material appearance – so they fit better and can be included in activity settings tied to local institutional practices.

In Hedegaard's version, activity settings are tied to motives (the concept has a wider use in psychology e.g. Segal & Hinojosa, 2006). Our actions in everyday settings are motivated by activities tied to settings like schools and homes, which are institutions with practices created at least in part by broader cultural expectations (Hedegaard 2014, 213). To an extent Hedegaard is inspired by the situated learning theories which have impacted theories of learning in cultural-historical approaches for decades (e.g. Lave & Wenger 1991; Lave 1988). The shortcoming of this approach, according to Hedegaard, is that these theories focus on the persons rather than the unity of the person and the environment. Instead, Hedegaard suggests a combination of Kurt Lewin's ideas on behavioural settings and a cultural-historical wholeness approach which emphasises the unity of environment and person. Together these perspectives form her understanding of activity setting because: 'It is in the activity setting within a practice that the relations between institutional objectives and the demands from institutional practice can be studied in relation to a person's motives and the demands in the setting that are placed on both other people and material conditions.' (Hedegaard, 2014: 215).

Other psychologists who make use of the concept of *activity setting* seem more concerned with the social relations (eg. Segal & Hinojosa, 2006) and do not, unlike Hedegaard, emphasize connections between persons and environments.

I want to follow Hedegaard in scrutinizing the connection between an environment of people and materials and take a closer look at the *material conditions* in the environment. Formerly, I have discussed the differences between how old-timers perceive, understand and move in an environment and the lack of unity between an environment and the newcomer. A newcomer does not immediately understand either the institutional practices that create certain expectations of behaviour in activity settings, or the meaningfulness of the materials tied to activity settings. A learning process often takes place over time that aligns the newcomer with the old-timers, nevertheless, the outcome may also be that the newcomer is forced to leave e.g. an educational institution (e.g. Hasse, 2014). I have also looked into how tools, as newcomers imposed due to a societal demand for changes in institutional practices, affect the local practices. These practices and activity settings are bound to change because the new tool comes with demands embedded in its material construction. However, the new technology is also bound to change because it is met with the local practitioners' conceptualizations, which may differ from those intended by the tools' creators. Thus when technologies are the newcomers they simultaneously reform the local practices while it is also reconceptualized locally (Hasse 2013).

Through an awareness of diversity in conceptualizations of tools, we may find a discontinuity in how materials are conceptualized by their users and creators. That new tools may instigate unexpected changes in institutional practices can be exemplified with a focus on how robots developed in Japan found their way to Danish nursing homes.

3. The Telenoid

It is about the size of a child, with slanting dark eyes, no hair and completely white skin. It moves its lips slowly as if murmuring something, and its eyes are scanning the room as if looking for something. Then it opens its almost lipless mouth and exclaims: 'Hello'. The most stunning thing is, however, that it has no humanlike limbs. Its body stops at the waist and its arms are only small stumps, sticking out from the tiny white torso. It bears the name of *Telenoid*. It has found its way to both nursing homes and rehabilitation centres in Denmark.

According to a Danish PhD thesis *Anthropomorphic Robots on the Move* by Christina Leeson (2017) the robot was created at a

Japanese robotic laboratory as a kind of telecommunication device. Though it looks like an autonomous robot, the Telenoid is actually operated from somewhere else by a person who can make its eyes, limbs and lips move, and also speak through it as if it was a mobile phone.

At the laboratories at Osaka University and Advanced Telecommunications Research Institute International (ATR) in Japan they have collaboratively developed the new portable teleoperated android robot with the aim of transferring peoples' presence through a robotic presence. Formerly their institutional practices had centred around similar teleoperated robots like the *Geminoid HI-1* (developed by ATR) and *Geminoid F* (developed by Osaka University and ATR), that replicated actual persons, and were intended to transfer presences of actual persons, according to their homepages.

The *Telenoid™ R1* (the robots full name) was designed, they explain, to appear and to behave as a minimalistic human.

At the very first glance, one can easily recognize the Telenoid™ as a human while the Telenoid™ appear as both male and female, as both old and young. By this minimal design, the Telenoid™ allows people to feel as if an acquaintance in the distance is next to you. Moreover, Telenoid™'s soft and pleasant skin texture and small, child-like body size allows one to enjoy hugging and communicating with it easily.

The term Telenoid™ is a new term coined from a prefix Tele-, as Telephone and Teleoperation, and the Latin postfix -oides which indicates similarity, as Humanoid. Using Telenoid™s, we will investigate the essential elements for representing and transferring humanlike presence. In practical usage, we expect Telenoid™ to be used as a new communication media,

Features of Telenoid™ R1 include:

- *A novel minimalistic design that can effectively represent human presence*
- *Soft and pleasant body*
- *Low cost due to decreased numbers of actuators*
  (Telenoid™ R1:9, Geminoid™ HI-1:50, Geminoid™ F:12)
- *Small-size body and simple internal structure by use of electric (DC) motors*
- *Easy teleoperation based on the teleoperation technology developed by ATR* [(http://www.geminoid.jp/projects/kibans/Telenoid-overview.html) Retrieved 4th April 2017].

The roboticists intended the robot to be almost like a human being but as a generalized human with no gender and a neutral appearance. As one of the roboticists explained to Leeson when she visited the laboratory: 'So, we are trying to create the situation where people feel *real* human presence in the robots. That is, a situation where the robots do not only transfer the operator's thoughts, sayings and image, but where they transfer *him* or *her*. They should transfer *his* or *her* presence so that the robot *becomes* its operator and thereby more than a thing' (Leeson, 2017: 54).

Far from being a tool in any ordinary sense of the word the robot was tested in a number of institutions with a strange implementation strategy. The staff did not know beforehand what the robot should be used for, but it would be part of their new task to find out how this robot could be useful. We followed this process in a three month field study in a Danish rehabilitation centre (Bruun, Hasse & Hanghøj, 2015) and Leeson (2017) studied its implementation as part of a larger project Patients@home.

In both cases the introduction of the robot began with staff who had had no idea what the robot could be used for. In the case we studied over a couple of months the robot was partly implemented because the rehabilitation centre had as part of its agenda to test new welfare technology; and partly because a research group of philosophers and psychologists were studying citizens' reactions to robots. In Leeson's case, the implementation of the same type of Japanese robot had two goals: to provide new insights of how the Telenoid was integrated into the health care system in Denmark; and simultaneously to develop a service model for the robot that, as Leeson notes:

…described how the robot could possibly be used; for whom and with what effect. An important aim of the project was thus not simply to evaluate Telenoid's effects on Danish healthcare but to contribute to commercializing the robot by identifying its application in the healthcare sector. In short, there seemed to be a common orientation among consultants and roboticists towards Telenoid as a case for further refinement and commercialization, and a shared understanding that this should put forward by establishing a project in which roboticists - engaged in the scientific development of robotic technologies - would be provided with the opportunity of testing their robot in Denmark.

(Leeson, 2017, p. 10)

How does a case like this address the existing discussions in cultural-historical theories about the understanding of tools as materials created in the process of goal-directed human actions? And how can the notion of institutional practices help us unfold these new dimensions? First of all, we may notice that the material robot, in some ways, acts as a driver and developer of human activity. The centre of activity is around the robot. We did not only identify actions that aimed at improving health care. As we shall see the robot itself actually created situations where the usual institutional traditions of health care were disrupted – not because the robot actually improved healthcare - but in order to improve the rather poor functions of the robot. Furthermore, the staff in the nursing home and at the rehabilitation centre strove to induce some kind of meaningful presence in the robot. It was apparent in both cases that a considerable 'stretching' on the part of the staff took place (Hasse, 2015) - and was most salient in the case we followed at the rehabilitation centre.

4. Robots in practice

'It is pitiful', Connie whispers. Anni is blunter. 'It looks scary', she says. Later Bente, who is leader of the rehabilitation centre

explains how she feels about the newcomer, the robot:

> I think the [robot] is scary. I think. I think it looks like a child… like … a dead child, because it's so human in the face and yet so rubbery in its movements. I wonder what the reaction will be when the elderly find such a dead rubber kid to sit and make them enjoy and eat. I could much better imagine that it was something that did not look like a dead child at all. I think it looks like a dead child! Ethical? So, I do not think you should have one … something that looks like something dead when you're going to sit and eat.

The reason Bente refer to eating is because one of the possible ways the staff plan to find a use for the robot is as an eating companion for elderly or impaired people. They have thought of several potential uses together with the research group, but this seems to be the most likely outcome of their endeavours. The robot could be used to talk to the people at the centre while they have supper.

The staff's evaluation of the robot's appearance is a far cry from the meaningfulness attributed to the Telenoid by its creators, who wanted people to experience '*real* human presence in the robots'. Following cultural-historical theory we need to expand our understanding of the seamless connection between materials and conceptualization, the material and ideal, in a globalized world. There is a considerable difference between the conception of the robot's appeal described by the Japanese roboticists and the local Danish staff, who have been asked to include it in their institutional practices.

The staff at rehabilitation centres and nursing homes does not learn about, let alone accept, the definitions that the roboticists at the Japanese laboratories have put on their website. The roboticists cannot decide or predict how their robot is to be perceived. In Denmark, the concept of 'robot' is in general very positive. Robots are not considered to be scary, but necessary for a future with more elderly people in the need of care where there is more work than warm hands. The staff reaction to the robot seems to be an evaluation of its immediate appearance, but their negative impression prevents them trying hard to include it in the daily routines of work at the institutions. The concept of robot is already formed when the Telenoid arrives – and it connects robot materiality with 'innovation' (Hasse, 2013). The staff further develop their own conceptualizations of what robots are and can be expected to do when they meet the Telenoid in their practice. They form an everyday concept that, as Vygotsky puts it: 'tends to develop outside any definite system; it [the concept] tends to move upwards toward abstraction and generalization' (Vygotsky, 1987: 168). Their everyday engagements become the true word-meaning of concepts of robots in health care that is entangled with everything they do at work. And their concept formation is an ongoing process. For Vygotsky,

> the abstraction and generalization of one's own thought differs fundamentally from the abstraction and generalization of things. It does not constitute further movement in the same direction. It is not the completion of the initial process of abstraction and generalization. It is the beginning of a new direction in the movement of thought, a transition to a new and higher plane of thought.
>
> (Vygotsky 1987, 230)

Vygotsky's theories of word meaning and verbal thinking were developed at a time when there was a belief in institutions as ordered and somewhat rational. Though Hedegaard's theoretical developments of the cultural-historical framework are produced much later they remain faithful to the notion of an ordered world with traditions and routines – but what I see as a major contribution to the Vygotskyan framework is the acknowledgement of how concepts keep evolving – also when tied to the complex engagements in a globalized world. Institutional practices in one place (like a Japanese robotics lab) may disturb and transform institutional practices in another place (like a rehabilitation centre in Denmark) – and thereby disturb the activity settings. In Hedegaard's oeuvre it is persons moving between intuitions who experience 'crises'. Today this is more important than ever to acknowledge that things, which move from one institutional practice to the next, can also create a form of crisis in institutions and act as breakers of routines, traditions and even (at least for a while) change the overall motive of the very institution. Robots in healthcare are an excellent example of this process. Though the main purpose of the rehabilitation centre is to rehabilitate citizens, this overarching motive with the institutional practice is disrupted by robots like the Telenoid. They are implemented to see what the staff can make of them in a constantly evolving process of change in the Danish health care system. And it is a process that changes both the work of the staff, and the meanings of robots in health care.

Even if robots disrupt local activity settings, over time, in both our and Leeson's case studies, the robot become more meaningful over time – but it is not the seamless connection envisioned by Cole and Derry. Rather it is a hard struggle that puts many new demands on the staff and their existing routines. The positive conceptualization of robots we find in general in Denmark is put to the test, when confronted with the robot in practice.

In the rehabilitation centre, there is no doubt that the staff experiences the insertion of the robot as an extra burden in a stressful work life. Several of the staff experience working with a robot as something that takes their time away from the core tasks of caring for the elderly citizens. One of them is Celia who explains to us:

> Honestly, I think it's been badly planned. I know that some money was put aside, so that we could hire a replacement [for me] but now it has been spent to hire someone else to do other work in the house, for instance. We are not relieved here and that means that I still have to do the same work on top of what I spend on the robot. It is bound to affect my service users because I cannot do it all. If I have to do it all, then I shall have to stay here till late in the evening. I'm fairly new to this work so I also take pride in getting things done. I do not want to go home before I am finished so I feel it has been hard on us [the staff] that it has not been planned better. So, I've been … So, I'm not st … It's is maybe too much to say I've been stressed, but I've been pushed. Really seriously pressed.

(Celia, local staff)

Even so Celia think it has been fun working with the robot as a break of the routines – but she does not think they will keep it, because it didn't ever get to function all that well in spite of all their work.

I look forward to seeing it go – so I can dedicate myself to my work again and not to have to attend to two things at once. But actually, I am annoyed that it did not function better. There have been so many technical problems, and many times I feel I have wasted my time by coming over, prepared to work with the robot, just to be told that due to technical problems we have had to cancel – that is annoying. I think it has been an exciting project, but I look forward to have full time with the service users again.

(Celia, local staff)

When we listen to the staff we hear a story of the robots as privileged material actors that will not let the staff go about doing their normal routines with the people they are caring for. This is an ongoing process and the staff constantly find new meaning with robots, but even if they stretch themselves very far to include robots, in the end the robots are excluded because they simply are 'bad technology'.

In spite of the robotic laboratories' attempt to influence the verbal thinking of the Danish staff with talk about the Telenoid as a new communication media that 'effectively represent human presence' this is not how it works in their institutional practice. Even so the staff, 'to their amazement' over time experience service users who open their hearts to the teleoperated robot in the dining situation. This is of course due to the fact that someone, even an ugly robot, actually takes the time to talk to them. Not person-to-person, but via the robot. The staff recognizes this paradox, but do not believe that they will be given the extra time for talking with service users whether through a robot or not.

In the end, the staff wanted to exclude the robot because it did not meet their very high expectations. It simply put too many demands on them, requiring them to change their traditional institutional practices. Here we see the strength of Hedegaard's approach – there may be attempts at disrupting the traditions that are visible in the activity settings that are made by new technologies, but in the end what holds the institutions together are these traditional practices. After a period of experimentation and frustration the robot is excluded and the routines with a main focus on the wellbeing of the service users are back. It is after all not the main objective of staff at Danish care centres to support and develop business models for robots. We can, however, return to Bronfenbrenner's systemic model and ask how it became possible for the Telenoid to enter the Danish health care system, when nobody actually had a clear idea of what it could do?

5. System vs institutional practice

For Bronfenbrenner the interaction of the micro-, and meso-, and exo-systems are nested as interconnected systems. They are manifestations of what Bronfenbrenner calls:

…overarching patterns of ideology and organization of the social institutions common to a particular culture or subculture. Such generalized patterns are referred to as macrosystems. Thus within a given society or social group, the structure and substance of micro-, meso-, and exosystems tend to be similar, as if they were constructed from the same master model, and the systems function in similar ways. Conversely, between different social groups, the constituent systems may vary markedly. Hence by analyzing and comparing the micro-, meso-, and exosystems characterizing different social classes, ethnic and religious groups, or entire societies, it becomes possible to describe systematically and to distinguish the ecological properties of these larger social contexts as environments for human development.

(Bronfenbrenner, 1979, p. 8)

In the case of robots there is a clear pattern of overarching values embedded in the word-meaning of robot that make the Danish healthcare sector an experimental playground for roboticists from all over the world. This was explained to us by one of the masterminds behind importing and implementing the Telenoid, a local director of a municipal welfare test centre:

Interviewer: Is the development [with more robots in the health care sector] positive or negative?
Interviewee: Somewhere - and now I'm a bit harsh – but whether it is good or bad is a superfluous question because the development happens in any case. But what is positive is that if you go actively all in and play along, then you have the opportunity to define and help as well as to guide what we want in the future. That is why we need to focus on robots and concentrate on participating in developing the future.

This response is a clear example of what we may call technological determinism as a societal cultural value (found in many Western and Asian cultures) (e.g. Ellul, 1964). This could be an example of what Bronfenbrenner called a 'macrosystem' 'the overarching institutional patterns of the culture or subculture, such as economic, social, educational, legal, and political systems, of which micro-, meso-, and exco-system are the concrete manifestations'. (1979, p. 515).

However, it is a naïve understanding of how technologies work in practice. Naïve technological determinism is, according to Langdon Winner, the idea 'that technology develops as the sole result of an internal dynamic, and then, unmediated by any other influence, molds society to fit its patterns' (Winner, 1980, p. 122).

As already argued, humans do not live in and through systems, but live in and through practices. The difference between Bronfenbrenner's approach and Hedegaard is that institutional practices and activity settings are not deterministically embedded in this overarching pattern or model that he called the macrosystem. Humans contribute to it actively. It is true that the Telenoid found

its way into Danish health care centres through a societal priority that emphasizes that the public sector engages in driving and testing technologies. However, the pivotal processes take place in the activity settings where the staff meet and engage with the incoming technologies. If they cannot use them, they disappear, because it is at the end of the day the staff who keep they eyes fixed on the principal motive for working in health care centres – and that is not to improve bad technology, but provide services for citizens. It is this motive that ends up excluding the bad technology. Though robots can have agency, in so far as they create real effects in the institutional practices, and also act through politicians and policy makers, human staff in the institutional practices possess a spirit that makes them overcome the crisis taking place within their institutions when new technologies (that they did not initially need or desire) are introduced.

6. Conclusion

Hedegaard's concept of institutional practices points to a number of important issues. Here we find the traditions that uphold activity settings and the material included in these activities. What matters is what is found to be of importance for upholding these activities. What matters, matter because the practices are meaningful to those that practice them. That is they are meaningful to think with and engage with. These practices in other words hold the potential to obtain the seamless connection between the material and conceptual sides of artefacts that fit the activity setting in the institutional practices.

It is in practice – in the activity settings that constitute institutional practices that meaning making and verbal thinking about robots is formed. As the concept of robot is already perceived as something meaningful (albeit in the sense: 'because they are coming anyway') robots are accepted into institutional practices. However, it is these same practices that prove that there are no unquestionable systems and no technological determinism (Ellul 1964) at stake. Materials play an important part in transforming institutional practices as well as activity settings – and in a globalized world we become aware that so called tools may find their way to practices for all kinds of reasons – but it is the overarching motives of the everyday work of the staff that in the end decide if we should include materials in our activities as meaningful or exclude them as meaningless.

This practice is not determined by an overall suppressing macro-shell of values (like the ones expressed by the municipal director) imposing themselves on local systems and individuals. These values are met with others that come from these local activity settings, their traditions, motive orientations and embeddedness in institutional practices.

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