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Technological Interventions and Subjectivity: Toward An Anthropology of Robotics for Medicine

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1. Medicine and the robot

I'm an anthropologist and I have been studying organ transplantation in Japan until now. So, in fact, I'm not a specialist of robotics. But, on the other hand, the field of medicine has much relationship with robotics. Recently in the news, *the da Vinci Surgical System*, a robotic surgical system, was reported to have been covered by health insurance[1]. This robotic surgical system represents the first practical application of robotics in medicine in Japan. Other applications of robotics include the home care support system of robotics for elderly people and intelligent prosthesis, both of which are already popular issue in Europe and Japan. Although the application of robotics to medical practices still seems to be rare, it is no doubt that the practical use of robotics will become one of the more important themes in medical anthropology in the very near future.

Thus, the aim of this paper is to think about questions of robotics for medicine from the point of view of organ transplantation, highlighting key areas for consideration in future research on robotics. In other words, I will attempt to discuss the social impact of robotics by referring to a series of studies in the past quarter century on the anthropology of medicine that have evoked many questions on human sciences.

To be sure, my attempt to join the discussions on robotics through a return to issues on current or existing medical technologies (such as organ transplantation, in this case) is prompted by the recent focus on the social repercussions and significance of robotics. For example, in 2008 the European Commission reported in the "Robot for Healthcare: Final Report" that the most important social factors in the domain of robotics for healthcare are ethical issues, social trends and cultural factors, especially with regards to acceptance of new technologies (European Commission 2008: 21). Indeed, one of the most radical issues in the field of medical anthropology – where human ends and machine begins – has already been raised.

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1 Yomiuri Shimbun (26 March, 2012). "Zenritsusen-gan no robot syujyutsu ga hoken tekiou"(Robot surgery for prostate cancer is covered by insurance). http://www.yomidr.yomiuri.co.jp/page.jsp?id=56475 (accessed 25 July, 2012)

> Where to draw the hypothetical line between human and machine in a legal and ethical sense. Such questions already arise in the context of bioethics and the question of creating chimera and humanized animals for organ transplant experiments (European Commission 2008: 29).

This European Commission report of 2008 puts forth the following issues:

1. The dehumanization argument
2. Social poverty and dying alone
3. Experimenting with the ill and vulnerable
4. Exploiting human emotions
5. Dual-use of technology
6. Human enhancement technology
7. Defining what is "human" and altering the human condition
8. Other future questions

Most of these issues do not seem to be novel, instead being rather familiar questions in medical anthropology. As an example, Issue 1 is the very reaction that Japanese society has taken when organ transplantation was introduced along with the concept of brain death. There are some who criticized organ transplantation as if it were barbaric technology, sometimes associating the medical procedure with the expression "cannibalism." To be sure, even today, there still exist many criticisms against organ transplantation in Japan, as opposed to other developed countries. Furthermore, other issues cited by the report, such as (2nd) alienation by technology, (3rd) experimentation, (5th) dual-use, are also central matters in the field of medical anthropology and bioethics. Personally, the (7th) redefinition of the human condition in the recent medical technology is exactly one of the most important research interests of mine, so far.

So, I agree with the argument of the European Commission report that most of the issues it highlighted have already been questioned in various contexts in the field of social studies of medicine. Nevertheless this does not preclude the fact that robotics itself cannot evoke a question intrinsic to its field. If the issues listed above are indeed crucial to the medical application of robotics, then it is fruitful to turn our attention to the existing research themes in medicine.

2. The case of organ transplantation

So, I take up the case of organ transplantation. It is sure that organ transplantation is one of the most typical themes in the matter of technological intervention. This is not only because of the idea of transplantation itself, but also because of the many practices that accompany this medical procedure. For example, the status of brain death is made possible only through the mediation of an artificial respirator, a highly technological intervention. Patients waiting for organs live with artificial hearts, artificial dialysis and so on. While these technological interventions are justified by the concept of medicine, they also create or recreate technologically-mediated experiences in their everyday practices.

My concerns here are devoted to the process of creating social problems in relation to such technological interventions. In the context of technological interventions, problems do not seem to occur simply between social order and new technology, but rather emerge in a more complex way. I think it is possible to apply the understanding of this emerging problematic around technology to the study of robotics, and I will take up organ transplantation as an example.

At first, organ transplantation and brain death tended to be discussed from the point of view of the transformation of the traditional value for the human body, understanding it as a topic of comparative cultural study (Lock 2001). It was presented in the context of acceptability of technology in each society. In this perspective, Japanese society seems to be a striking example due to the fact that since brain death is not regarded as a death it was instead explained as a cultural difference.

However, such an exposition paid little attention to the practice of patients. As "Japanese culture" is not static but rather dynamic and plural in itself, medical technologies inevitably impact society in varying ways, even reflexively influencing human behavior itself. While it is true to say that some people would support organ transplantation and that some would oppose it, it is also an over simplification to take everything in a cultural or social context. Most importantly, these kinds of arguments do not consider the transformation of the cultural practice itself as a consequence of technological interventions.

Here, I will cite a study by Bruno Latour to explain the co-generation of body and society. His work shows us that technological intervention should not be understood as a problem but rather should be seen as a possibility that opens up a new world. He takes up the role of odour kits for the Aromaticien[2] (cf. Teil 1993). Latour explains that the kits enable the

[2] From the French word referring to the person manipulates aromatic compounds

Aromaticien to discriminate more and more subtle differences in aromatic compounds, allowing him to accurately distinguish one from the other. In effect, Latour argues, Aromaticiens had *acquired* an organ by using kits that defined the ability to detect chemical and other differences.

> Through the training session, Aromaticiens learned to have a nose that allowed her to inhabit a (richly differentiated odoriferous) world. Thus body parts are progressively acquired at the same time as 'world counter-parts' are being registered in a new way. Acquiring a body is thus a progressive (Latour 2004: 207).

In other words, technological interventions have an impact not only *in the society* or *on the body*, but also *as an articulation* of the relationship between body and its milieu. If one analyzes societal order and its concomitant problems as social deviances -- and treats each of these two aspects as conceptually independent or mutually exclusive -- then the impact of technological interventions may not be fully understood. Beyond the impact and consequences of a problem is found the more important and difficult question of process. Allow me to expound on this a little further.

Consider the status of brain death diagnosis and the decision of organ donation as an example. At the moment that a patient is suspected to be brain dead, the family receives an adequate explanation of the patient's physiological condition. This explanation is absolutely scientific. In many cases, it is difficult for families to understand the situation intuitively. Physiological conditions are explained with such non-layman, technical terms including figures of vital signs such as brain waves, partial pressure of arterial carbon dioxide and so on. Then one mother told me that:

> As a matter of course, I personally believe that my child might still be alive even under the condition of brain death. I couldn't accept the explanation. So I exclaimed: "she is covered in sweat!", or "she still has a temperature!" Each time something in her body moves, I claimed "She is moving!" But each time I take such a response, our doctor explained again and again that it was just because of the ventilator and that without it she would not be able to move by herself. I could not believe it. I always believed in a miracle and calling her name many times. After all, the best thing we can do is only to take such a non-professional response.

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thereby creating perfumes.

The father also told me that he cannot completely understand the situation of brain death and that the decision to donate his daughter's organs is beyond their daily experience. I do not intend to discuss the right or wrong of their decision[3]. Instead, I will focus on the character of this technologically-mediated action.

When families are informed of the brain death of one of its members and a decision to donate his/her organs is made, it may be said that the family is not acting in complete "self-determination." Indeed, the agency in this context is multiplied. This is because their decision to allow the harvesting of organs was mediated by technologies which – in acting out their own agency – culminated in its diagnosis of brain death. Organ transplantation then can be understood as a complex of human and technology where now the question of "subjectivity" shifts to a new form, that is, a technology-assisted subjectivity or, stated differently, a subjectivity the impetus or inception of which is due to technological interventions.

Most of the families who are confronted with the situation of brain death recognize the situation with multiple mediations and they themselves do not realize the death with their own actual feelings. The acceptance of death, the most basic matter for living things, transforms from the basis of daily experiences to the basis of highly technological experiences. The "subjective experience" that is presumed here seems to be entangled in the reflexive process of the technology, thereby transforming the experience itself.

I think this shifting context would be important because such a mediated experience cannot be explained by families. It is always difficult for families to explain the experience in their own language, because it is truly a scientific matter. This explains why the Father I mentioned previously expressed his belief that the decision for organ donation was beyond their judgment.

We can see here that brain death, the hybrid of body and machine, changes the order of the body and the process of decision-making at the same time. In this case, thinking about body is equal to thinking about the technology in scientific terms, and vice versa. The hybrid of body and technology includes the reflexive process of interacting and intersecting with each other. And through this process, the possibility of changing order and transforming values occurs.

During the past few decades, problems of bioethics are discussed, for example, from the point of view of the human dignity (Habermas 2003), wisdom of repugnance (Kass 1997) and the principle of self-determination in most cases. But I would like to say that the key notion in discussing technological intervention is to grasp the human condition within the agency of

[3] It is sure that they finally agree to donate their daughter's organs. And it also means that they decided to think of the brain death as death after a lot of consideration.

technology, that is, understanding the reflexive process between body and technology and understanding how people make their decision under this technologically-mediated condition. This leads us to the transformation of the body and the social order *at the same time*.

If we tackle only one of these two aspects while neglecting the other (i.e. discussing only from the point of view of body affection *or* only from the point of view of the function of technology), then the criticism is set out of context. The criticism neglects to consider that technology itself has its own agency. As a result, the criticism of classical bioethics overlooks the fact that the implications and formulation of human dignity and wisdom also undergo a transformation of their own in the emergent, technologically-mediated context.

As for the context of organ transplantation in Japan, technological intervention was criticized as a commodification of the human body, as increasing inequality, as being against human dignity and so on. But these kinds of criticisms are just one part of this technology, ignoring the broader possibilities of the experiences, like those of the family cited above. What is critical is to focus on the process of decision-making resulting from or as a consequence of technologically-mediated action. Persons who express difficulty in comprehending the nature of technologically-mediated decisions – such as in deciding to allow organ harvesting – cannot be criticized as ignorant as they are called to make a decision that is beyond their current knowledge and, more importantly, their life experiences. Rather we must see that a new form of subject is emerging, one that is a hybrid, a complex of human and technology. The task at hand then becomes one of describing this new subjectivity after which the question of human dignity or wisdom can be introduced.

The problematic is found in the shifting context of decision making. This is directly related to the reconsideration of the human condition of subjectivity and experience. Fully appreciating the impact of technological interventions will require a new concept, a new understanding of what it is to be human. Without this re-formulated understanding of the human experience, technological interventions will continue to be seen as events outside, or external to, what is perceived to be the core human experience. This externalization of technological interventions will then, in turn, lead to a misunderstanding of the hybrid condition of brain death which - separately and at once - deals with both the human condition and technology and the way they are intimately connected.

3. Toward an anthropology of robotics for medicine

While Japanese society can be said to be quite acclimatized to robots (e.g. Iwao 2003),

the same may not be true in the case of organ transplants. Yet both robots and organ transplants involve technological intervention, though differing in their consequences. I am inclined to think that in the case of organ transplantation, the reverse side of the criticism may be more apt. It is irrelevant that Japanese society is familiar with robots but unfamiliar with organ transplantation and brain death. This is because both views ignore the process of co-generation. Thinking about the reflexivity between body and technology and paying close attention to the world emerging through their new-found relationship allows an expanded understanding of robots free from the burden of operating within a societal framework. In this unbridled perspective, we can recapture the fact that we humans have long been living with technology throughout history – thought to be a great event which separates humans from other primates.

The European Commission and also the strategic research agenda for robotics by the European Robotics Technology Platform (SRA 2009) estimate that the practical use of robotics for medicine will be realized by the year 2020 at which point the major commercial manufacturers will be defined and the market will transition from technology push to consumer pull. Medicine seems to be one of the central markets for the robotics. If so then I think it will be necessary to think of robotics not as an object to control in a society but as an element of building society and humanity. The understanding of the hybrid condition and the reflexive process within it are one of the important arguments that medical anthropology has shown through its study of biomedicine thus far.

References:

European Commission

2008 *Robot for Healthcare: Final Report*. [online]. Available at: http://ec.europa.eu/information_society/activities/health/docs/studies/robotics_healthcare/robotics-final-report.pdf (accessed 20 July, 2012)

European Robotics Technology Platform

2009 *The strategic research agenda for robotics*. [online]. Available at: http://www.robotics-platform.eu/cms/index.php?idcatart=119&client=1&lang=1? (accessed 20 July, 2012)

Habermas, Jürgen

2003 *The future of human nature*, Cambridge: Polity.

Iwao, Sumiko

2003 "Japanese Creativity: Robots and Anime" *Japan Echo* 30(4) [online]. Available at:

http://www.japanecho.com/sum/2003/b3004.html (accessed 20 July, 2012)

Kass, Leon R.

1997 The Wisdom of Repugnance, *New Republic* 216(22): 17-26.

Latour, Bruno

2004 How to Talk About the Body? the Normative Dimension of Science Studies, *Body & Society* 10(2): 205-229.

Lock, Margaret

2001 *Twice Dead: Organ Transplants and the Reinvention of Death*, Berkeley, Calif.: University of California Press.

Teil, Geneviève

1998 Devenir expert aromaticien: Y at-il une place pour le goût dans les goûts alimentaires?, *Revue de Sociologie du Travail* 40: 503-522.