Regulating ‘Respect’ for the Embryo: Social Mindscapes and Human Embryonic Stem Cell Research in Japan

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This article explores the relationship between the science community and the bioethical regulation of human embryonic stem cell research (hESR) in the laboratory and in daily life in Japan. It develops a perspective that takes into account the diversity of views among principle investigators (PIs) and scientists working in the laboratory. Deploying Eviatar Zerubavel’s notion of social mindscapes and the notion of mindsets, I elucidate the relationships between the personal and the professional, scientists and the public. Introducing the concept of mindset switching, I argue that scientists’ views of embryonic substances cannot be understood adequately in terms of the rhetoric of boundary making alone. The use of cognitive notions of social mindscapes applied to situations in the life of scientists has far-reaching consequences for both the implementation of research regulation involving respect for the embryo and for the public discussion on the use of embryonic substances. The article is based on interviews with over thirty scientists working with embryos and stem cells during fieldwork visits in eleven science institutes in Japan.

Introduction

This study explores the ethical views and experiences of scientists in Japan regarding the regulatory requirement of ‘respecting the embryo’ in the socio-cultural contexts of research laboratories. ‘Respecting the embryo’, as discussed below,
became increasingly central to controversies over the regulation of human embryonic stem cell research (hESR) in the evolution of Japanese research into the life sciences.

As part of a government policy directed at stimulating economic growth, since the 1980s, government and industry have been promoting the development and advancement of biotechnology (Inaba and Macer, 2003, pp. 78–90). On 30 November 2000, the Japanese Parliament enacted the ‘Human Cloning Regulation Act’, creating ample allowance for in vitro human embryo research, and in September 2001, the Koizumi government approved the use of ES cell lines for basic research. With the subsequent issue of ‘Guidelines for Derivation and Utilization of Human Embryonic Stem Cells’ (2001) by three ministries, Japan became one of few countries that officially permitted research on human ES cells.

In the spring of 2002, major steps were taken to create centres to advance stem cell research in the country—one at Kyoto University and the other at the RIKEN institute facility in Kobe. At Kyoto University a plan to create embryonic stem cells from fertilised eggs left unused from fertility treatment was approved in late March by a government panel. A second step was the opening of the new Centre for Developmental Biology (CDB) in Kobe in April 2002 (Kato, 2005). In May 2003, researchers in Japan produced their first domestic human embryonic stem cell (hESC) lines. Professor Norio Nakatsuji of the Institute for Frontier Medical Sciences (IFMS) in Kyoto and his team announced their success in isolating hESCs from one single donated frozen human embryo. In a next step on the road to biotech regulation, on 23 June 2004, Japan’s highest-ranking organisation for science and technology policy-making, the Cabinet’s Council for Science and Technology Policy (CSTP, Kagaku Sogo Kenkyukai), opened the door to the cloning of human embryos (Foreign Press Centre, 2004). Shortly thereafter, on 1 July 2004, the health ministry’s ethics committee voted unanimously to allow the use of stem cells from aborted foetuses in clinical research (Cyranoski, 2005).

Despite this success, scientists have voiced their dissatisfaction with the strict regulatory regime in Japan. Although guidelines allowed the destruction of embryos, the need to respect human embryonic stem cells and the embryo itself was emphasised. In addition to obtaining informed consent from the donors with the possibility of withdrawal (Ida, 2002, pp. 1147–1148), each research application was to be double checked, first by the local institutional review board (IRB) and then by the Experts Committee on the governmental level. The cell lines in question may only be used for basic research, and fertilised eggs can only be obtained from married couples after written consent and without compensation (Harris, 2002). Although scientists in the UK may regard ‘clear guidelines and strict rules’ for hESR as work-enabling (Wainwright et al., 2006, p. 742), in Japan a combination of ‘unclear and strict guidelines’ is perceived to have a restrictive effect. And in contrast with the situation in the UK, combining bioethics with research needs in Japan elicited strong protest from scientists in the form of letters of complaints, publications and pressure on governmental institutions for the clarification of bioethical regulation (Hishiyama, 2003; Kayukawa, 2003; Slingby, Nagao and Akabayashi, 2004).
The strictness of the regulation of hESR in Japan until 2009 is further illustrated by the fact that the application for permission to use stem cell lines was extremely laborious—every change in the project and personnel required additional applications. Both senior and junior Japanese embryonic stem cell (ES-cell) scientists expressed their envy of UK research assistants, who handle ES-cell lines without applying for extra permission. Very persuasive are the data showing Japan’s high success rate in mouse research and its low success rate in hESR, if measured by Japan’s global share in publications (Cyranosky, 2005). But although less strict regulation was demanded, none of the scientists interviewed expressed the wish for a form of state-based regulation such as can be found in the US, or slack regulatory implementation, as associated with China. Reputation and trust were regarded as more important to their institutional survival than ‘over-permissive’ regulation (Sleeboom-Faulkner, 2008).

Rather, the mandatory respect for embryos and embryonic cells in the laboratory was found to be problematic. The governmental subcommittee on hESR defined the human embryo as the ‘sprout or germ of life’ (Seimei no hyouga), demanding respect in handling human embryos and hES cells. Although debates on the bioethical aspects of hESR have yielded uncomfortable questions in religion and culture internationally (see Holland, Lebacqz and Zoloth, 2001; Bonnicksen, 2002), in Japan these issues were relatively low-key for various political, historical and institutional reasons (Sleeboom-Faulkner, 2008).

Central to this article is the relationship between the perception of scientists of the embryo and its coexistence with official guidelines that demand respect for the embryo. It explores how the regulation of respect for the embryo is experienced and characterised by scientists. As scientists play a main role in discussions on hESR and regulation, these questions are crucial to public deliberation. If, say, there is a large discrepancy between the way in which scientists regard the embryo socially and professionally, we may have to ask if hESR is a form of research that, on the basis of values associated with home-life, no one really supports. And if the requirement of respecting the embryo at work involves combining ways of thinking usually associated with daily life and professional life, how do scientists deal with this?

To address these questions, this article draws on interviews held with stem cell scientists. During my first interviews with scientists in the stem cell hub in Kyoto University, it became clear that scientists, when dealing with professional questions at work and when thinking about issues associated with relatives at home, viewed the embryo differently. These views belong to different lifeworlds and different sets of issues, which are not always brought together to form one consistent paradigm. Sometimes these social ‘cosmologies’ seemed to clash, and sometimes they were presented as self-consciously knitted together into a consistent view.

I soon realised that the discrepant cosmologies corresponded roughly to views expressed by scientists conducting research in the laboratory and scientists who were principal investigators (PIs). Interviewees from both groups confirmed the importance of this distinction in various ways. First, while laboratory scientists focus on laboratory research, PIs look after the administration of the laboratory,
apply for research funding, and acts as the public face of their laboratory. Second, PIs carry responsibility for the research centre, the research done in the laboratory, and for the conduct of its personnel. And, finally, PIs regard themselves as important to the process of writing, although they involve main researchers. Although there are exceptions, it is clear that major PIs and heads of research units associate their work with science theory and not with the work of conducting experiments. Noticing this discrepancy, I included questions about the different lifeworlds of scientists in interviews. Thus, one set of questions about ‘respect for the embryo’ concerned their own and their families’ experience of birth and IVF, while another set of questions concerned the practicality of bioethical guidelines in the lab and public opinion on hESR.

I conceptualise research findings using Eviatar Zerubavel’s term ‘social mindscapes’, to which I add the concept of ‘mindset switching’, explored below. Zerubavel’s term of social mindscapes I use here to indicate the kind of thinking human groups share, for instance, as members of scientific community, a family, or a professional role (Zerubavel, 1999). Such social mindscapes differ from the personal views of individuals in that they are intersubjective (Schutz, 1973, pp. 10–15). At the same time, they are not regarded as universal, as they are shared by thought collectives (Fleck, 1979, p. 39) and acquired through education, upbringing, language and tradition.

I use the term social mindscapes to explore the ways in which scientists working in the laboratory and PIs—research scientists and science managers—relate their normative ideas on embryonic substances to their work, their extra-professional life and their socio-cultural cosmologies. The concept of social mindscapes highlights the paradigmatic and contextual aspects of shared thoughts and attitudes. This concept contrasts with the idea of scientists erecting rhetorical boundaries between science and society (Gieryn, 1983, 1999), which essentialises the difference between objective science and other knowledge to protect their cognitive authority (Cunningham-Burley and Kerr, 1999, p. 648). For boundary making, here is intentional and strategic, while the social mindscapes gives a formulation to the social embedding of cognition and the linkage between mindsets associated with different environments of social life. To denote radical change in thinking associated with a movement between social environments, I speak of a ‘mindset switch’, which is not usually the result of strategic deliberation.

Method

This study builds on interviews with thirty scientists from universities, hospitals and research institutes, held from April until June 2006 and from March 2008 until April 2008. The interviews were held in the main hubs of stem cell and foetal research in the Kansai area (the Institute for Frontier Medical Sciences [Kyoto University], the Institute for Bioethics Research and Science Communication [Kyoto University], the Translational Research Centre at Kyoto University Hospital, Tanabe Pharmaceuticals, the Japan Cell Bank in Osaka, and the RIKEN Science, Technology & Society 18:3 (2013): 361–377
Centre for Developmental Biology [CDB] in Kobe) and in the Kanto area (Keio University, Tokyo University and the National Research Institute for Child Health and Development). Methods used in this study include loosely structured questions on the meaning of biological notions such as dedifferentiation, fusion and reprogramming, the state of the art of somatic and embryonic stem cell research, research regulation at home and abroad, bioethical views on the embryo, embryo donation and the beginning of human life, the scientists’ own research aims and the difficulties associated with them. During the interviews, I left the definition of the embryo open to interpretation. In Japanese, a distinction is made between ‘hai’ (embryo) and ‘taiji’ (foetus) and, just as in the UK, the interpretation of the concepts depend on the scientific, legal and social context in which they are used (see Pfeffer and Kent, 2007). The translation of interviews held in Japanese is indicated. Although the interviewees in this study had no objections to their views being quoted, I decided not to cite their names, but to use numbers instead. After all, this article aims to discuss the dynamics of the discussion concerning hESR, not the views of scientists personally. A thorough search, however, could yield the names of some of the interviewees.

The first section of this article introduces views of scientists on embryonic/foetal stem cell regulation. The second section introduces the notions of ‘social mindscapes’ and ‘social mindsets’, discusses scientists’ bioethical views on the embryo/foetus and the ways in which they respect the embryo, and introduces the distinction between science managers and research scientists. The third section discusses the views of research scientists on the ‘beginning of human life’ and on ‘respecting the embryo’ in the laboratory. And the final section discusses some of the implications of socially triggered mindset switching for bioethical research regulation and public debate.

Diverse Perspectives among Principal Investigators Regarding Embryonic/Foetal Cells in Clinical Applications

The disagreement in Japan on the bioethics regulation for hESR applied in a clinical setting from 2003 to 2006 provides us with a discursive background of existing views on the foetus. A professor and principal investigator (PI1) in developmental paediatrics at Kyoto University related how the regulatory committee (under the Ministry of Health, Welfare and Labour (MoHWL)) did not succeed in including guidelines on the regulation of hESR in a clinical setting, partly due to the discovery of two foetuses discovered in the waste of Yokohama City Hospital (Yokohama Shinai Byouin) in the summer of 2004. According to PI1, people were afraid of scandal and change: Japanese people prefer to obey their superiors or the government rather than try out something new.

PI2, a Professor at Keio University, believed that the delay in the guidelines was due to feminist anti-abortion groups, who, he claimed, argue that scientists drive up abortion rates to hide their requirement for a high number of embryos. PI2 hoped that regulation would save the reputation of scientists from such accusations.
PI3, originally an embryologist, but now a professor in bioethics and a member of the Committee for the Creation of Guidelines for the Use of Human (Somatic) Stem Cells in a Clinical Setting, opposed the views of PI2. PI3 urges women in Japan to ask themselves whether it is truly for science or to please the physician and others around them that they want to donate their embryos and oocytes. PI3 also believed that, as stem cells are little understood as yet, it was far too early for ‘human experimentation’. Having been an embryologist, PI3 looks back on how much fun it was to conduct experiments with sea urchins:

It was really interesting. Trying out new things was very exciting! It is a kind of curiosity that motivates scientists. I believe that there is a lot of this curiosity and challenge of doing things that no one has ever done before, even though they may also do it for the patients. (PI3) (Trans. MSF)

Someone needs to limit this boundless curiosity, PI3 argued, as scientists are not going to stop themselves. But PI3 does not believe that the government would try to control their behaviour, as the Ministry of Education, Culture, and Science and Technology (MEXT) would not risk its position in global competition—its priority is getting Japan out of the economic slump.

PI4, a Professor in the Translational Research Centre at Kyoto University Hospital, had similar, and perhaps even more outspoken, views about the safety dimension of embryonic/foetal stem cell research. Embryonic and foetal stem cells, according to PI4, ‘are still too little understood to inject into the brains of patients’. PI4 blamed the laxity of government regulation for the poverty of the discussion and the unclear status of the embryo/foetus. Like PI3, PI4 asked for stricter rules ‘to restrain ourselves’. This, he believed, would improve the quality of bioethics committees, which currently varies greatly between universities.

In short, the advocates of various perspectives all agreed on the need for regulation of the bioethical aspects of research, either to protect the scientists’ freedom of research and creativity or to protect scientists against their own curiosity and creativity. The bioethical aspects of the regulation of foetal/embryonic stem cell research in a clinical setting was clearly linked to the issue of abortion, women’s (and their spouse’s) ability to decide about their bodies, and the ethical value of the embryo and foetus—and possibly the competitiveness of Japan’s economy. In the next section, I explore the ways in which scientists value the relationship between the embryo/foetus and daily life.

**The Bioethical Value of the Embryo/Foetus**

In this, and the next section, I use the notions of social mindscape and social mindset to explain differences in thinking between certain groups of scientists. Here, I tread the social field between cognitive individualism and cognitive universalism (for example, such as used in the work of Chomsky, Piaget) called social mindscape (Zerubavel, 1999). Social mindscapes have their own categories of normality and

*Science, Technology & Society 18:3 (2013): 361–377*
deviance, correctness and nonsense. Scientists, too, learn to frame their experience, generalise their observation and reason their behaviour in what are socially perceived as appropriate rules, etiquette, law and style. One individual social being, however, may have multiple identities, and move between different social settings or mindscapes by changing what I call social mindsets. In society, and within science, a cognitive division of labour yields different mindscapes, for example, of various professions. Professional perception is filtered through various interpretative frameworks. Social mindsets are shared by social groups that move between social mindscapes in similar ways, and have not (yet) integrated them as a new mindset.

Here, I propose that scientists involved in science management interpret embryonic substances, at least partly, differently from researchers in the laboratory or research scientists (RSs). Donald MacKenzie makes a similar distinction between technicians and scientists on the basis of social distance from the research material when describing what he calls the (un)certainty trough in connection with the trust in or doubt of the accuracy of missile guidance systems (MacKenzie, 1990; 1998, pp. 325–329). Central in the current study, however, are the sensual proximity to and the functional distance of the laboratory scientists and the research managers from the embryo rather than the intimate knowledge of safety or reliability of (missile guidance) equipment. In parallel to MacKenzie’s analysis of the views of technicians, scientists and those alienated from science institutions (MacKenzie, 1990), it could be argued that the scepticism towards the ability to respect the embryo in science is high among research scientists, low among research managers, and high among those committed to alternatives to human embryonic stem cell technologies (Sleeboom- Faulkner, 2008). But this article tries to do more than report expressed amounts of scepticism: it shows why laboratory-based research scientists express inconsistent views, while science managers do so to a much lesser extent. For, as analysed below, the expressed attitudes of scientists towards embryos in hESR cannot be explained in terms of making boundaries between science and society to strengthen and justify their research.

Before applying the notions of social mindscapes and mindsets, I show how, in the eyes of science managers, regulation and science clash. SM5, from an Institute in West Japan, is a main public face of hESR in Japan. SM5 plays an active role in various committees and organises lectures on stem cell research and bioethics. When asked about the beginning of human life, SM5 offered his views on the topic, both as a biologist and as an individual, indicating that he is aware of and uses various criteria for creating boundaries between valuable human life and research matter:

From a biological point of view, life is continuous: germinal stage, implantation, foetus, birth… In my view, a new life begins when the foetus can survive in hospital, perhaps with the help of a machine. Well, personally, I feel life begins a little earlier than that. (SM5)

An embryo of twenty-five days, according to SM5, can be described as a clump of cells, but after fifteen weeks, he explains, it approaches a human being.

Although SM5 does not believe that the embryo/foetus possesses a spirit or a soul, he personally regards the neurological functions and human features of the embryo/foetus as some form of humanity. When it comes to the use of embryos for research, however, a leap of thought brings him to his general concern about the extent to which the embryo/foetus can be obtained for work: ‘Do you know how many abortions take place in Japan? Over a thousand a day! And then they worry about discarded frozen embryos!’ (SM5)

The requirement of researchers to treat embryos with respect, in this context, SM5 regards as problematic:

The bioethics committee [that created the guidelines] contains scientists, but not people that are directly linked with hESR. For this reason, the guidelines have become unclear and vague. And as an ultimate result, the guidelines become strict without good reason! For instance, the same [strict] conditions apply for doing experiments on ordinary cell lines! Even if they do not involve any embryonic research! (SM5)

For, apart from scientists, SM5 explains, the bioethics committee contains a theology scholar and bioethicists, who have very different outlooks on the embryo.

Differences in the views of individual scientists on the embryo seem to depend on whether my question was placed in the context of the family or of the laboratory. For instance, SM6, from the Department of Reproductive Biology and Pathology at a research institute in Tokyo, when asked about his sense of respect for the human embryo and foetus when talking about his family, explained: I need to be sincere; treat them preciously. Also the cryopreserved eggs… (SM6)

Moments later, he switched to his professional mindset, regarding the use of embryonic substances essential to his job:

But after the generation of ES cells, we are talking about cells. They cannot divide into humans! It is impossible! Just a cell! Regulation is therefore too strict. Ordinary stem cells or cells should not have to be respected! (SM6)

SM5 explains the reason for his outrage about the regulation of respect for cells, shared by others, with the following example:

There is one instruction that prohibits having stem cells and somatic cells in the same incubator. At first I thought that they were worried about contamination, but this was not the case. The reason was that the stem cell lines had to be respected! (SM5)

It would be disrespectful then, sighs SM5, to place the precious embryonic stem cells in the company of the more humble somatic cells: We keep the embryos in a secure place, and we also keep records of what happens to them. Even the remaining liquid of the embryo we evaporate in a special furnace (SM5).
Friction, then, has come about between the respect a scientist can muster for the embryo, his/her scientific understanding of the research material, and the regulatory requirements for dealing with precious and scarce reproductive materials.

What I propose here is that, depending on whether a scientist switches between social mindsets, a scientist’s normative judgement of the embryo may alter. A change of mindsets took place when SM7, director of a centre engaged in hESR, gave both his personal and professional view on the beginning of life. At first, he places the moment life begins early:

For me as an individual, it [the beginning of life] is at biological fertilisation. It is the secret germ of life. But biological life is a continuous process. It is not deterministic. Whether it is the same as a newborn baby, I doubt… (SM7)

The professional interpretation of the embryo, however, is quite a different matter: When it is decided that the embryo is going to be discarded, it is a clump of cells (SM7).

Embryonic stem cells, SM5, another project leader, defines in terms of his research:

(It is) a system which we use to renew cells: there is a need for the renewal of a system when it becomes old. We need to replace it. The in-vitro ES cells are just man-made products of multi-potent cells, for they are isolated from nature. They are artefacts. (SM5)

In other words, in these views, the social embryo has value as the ‘secret germ of life’, while the discarded one that lands on the workbench is a clump of cells. And if we take cells out of their (perceived) natural context, they become artefacts. The change of mindset replaced SM5’s personal cosmology by a pragmatic material embryo. SM5 also referred to the views belonging to the social mindscapes of couples undergoing IVF treatment: It [the value of the embryo] entirely depends on the relationship of the donors [with the embryo]; on their will. If they think the embryo is important, then it is more than a clump of cells (SM5).

Although to SM5, when at work, embryos are chiefly cells, he recognises that they are not so if potential donors think otherwise. His preparedness to include the views of others may have been formed by his experience in ethics committees, and his interaction with critics:

‘Respect for the embryo’ then means ‘to recognise the opinions of others’. If other opinions think that the embryo is alive, then you have to respect that. If society expects me to conduct a ceremony, then I would do so if it would persuade them to help research. (SM7)

SM7’s willingness to go through the motions of a ceremony without attaching ritual meaning to it himself, that I did not find among research scientists, is discussed...
below. This view seems to be a dialectical result of SM5’s position as both scientist and public face, in which he is forced to adopt views from other mindscapes without being able to subscribe to them. Rather than essentialising the boundary between objective science and the living world, SM5 adapts to the mindscapes he finds incommensurable. His respect for other mindsets, he maintains, would allow him to attend burial rituals. This, however, he would do for ulterior reasons, as he regards as meaningless the performance that donors take seriously.

Science managers do not necessarily have to move between social mindsets when at home, at work or when faced with the public and donors. SM4, the enfant terrible among science managers, sticks to his views on the beginning of life no matter what social context. He, like many developmental biologists, regards life as a continuous process. But unlike most biologists, he adheres to a universalistic view of embryonic or foetal research:

The definition of human life is very, very simple. It is either fertilisation or conception. By using the definition of conception, we can solve all ethical problems. IVF-fertilisation in itself, as it happens in vitro, can never lead to the birth of a human. But if it is returned into the uterus (in vivo) and left alone, it will develop into a human. (SM4)

To SM4, a ‘reasonable person’ does not use their foetus to cure him/herself. This is where, in his view, the problem of defining the dignity of humans begins:

Although an embryo of up to twelve weeks old is regarded as rubbish, there is something ethically strange about cutting it up. Even though it has the shape of a human and the potential to become human, it is not acknowledged as a human being. Its birth is not granted … Using it for research is grotesque! (SM4)

This, which SM4 calls an ‘intuitive’ view, does not involve multiple mindsets. SM4 refuses to compromise his ideas about the development of the embryo out of principle. Any discontinuity in the embryo’s development he regards as a violation of the integrity of the process. Such intervention he finds both indecent and wasteful. Although SM4 does not participate in foetal research, it is his job to facilitate others with the translation of basic research into its clinical application. Consciously considering the social context of science, at work, he does not hide what he calls his constructive criticism. Rather than creating boundaries between science and society, this scientist pulls them down, viewing his disagreements with other scientists as social ones. However, an important similarity between SM4’s views and those of other science managers is that they are well argued, easy to follow, and take into consideration various publics. The concept of science manager here allows us to see the similarity of the ways in which views of PIs are formulated across different social environments, between ‘science’ and ‘society’. In the following section, it becomes clear that the views of research scientists, who do most of the actual
research in the laboratory, are much less radical and appear less consistent than those of the science managers outlined above.

Research Scientists and Respecting the Embryo

Views held by research scientists were less elegantly argued compared to those of science managers. They are, perhaps predictably so, more in line with what is practised in the laboratory.

RS1, a professor at the Department of Stem Cell Biology in a Kyoto research institute, worked on identifying important genes for the generation of pluripotency in mice. This relatively young PI is exceptional, as he conducted his own laboratory work until 2006, after which time the focus of his effort was as a science manager.5 His long-term goal was to convert somatic cells into pluripotent cells, a technology that could avoid using oocytes. Nevertheless, according to RS1, human life begins only after the implantation of the embryo in the womb, when the brain (neural tissue) starts developing. But, although you cannot see much difference between an embryo before and after implantation, RS1 argues it does not mean ‘life’ is not there.

RS1, too, regards life as a continuous process. And, as many scientists do, when asked if an embryo has a soul/spirit (tamashi), he referred to the scientific process of neural tissue formation, explaining that he does not believe in spirits. But RS1 was not exactly sure if it is ethical to use human embryonic stem (ES) cells in research: I try not to think about it. I used to be a doctor. By chance I once unexpectedly saw human embryos through a microscope. I felt awkward. I imagined a shape and thought that these could be my daughters potentially. I thought that I could use these to generate new cells or that I could donate them to an infertile couple. They could have children, like my daughters. (RS1)

Here, RS1 described his ‘spontaneous’ reaction to watching human embryos. Though the sight of embryos did not touch him emotionally (as embryos look much like any other cells), the sudden realisation that he is watching potential human life made him feel uncomfortable. When discussing the procurement of reproductive research materials, however, RS1 seemed to see reproductive tissue simply as objects: They are cells with tremendous potentiality. But, in fact, sperm also consists of cells. Nearly all life consists of cells. So it does not really mean much (RS1).

RS1 implied, then, that ‘consisting of cells’ cannot be a criterion for valuing life. This concept of norms and values clashes with the regulatory directive of dealing with embryos with respect. And cell biologists, who do not normally value cells ‘in their domestic social life’, learn how to express politically correct views on the issue. RS1 relates his first experience with the local IRB:

Human ES cells are somehow different from the ES cells of other species. I have just become a member of the IRB. The chairman asked a researcher, ‘Do

you respect ES cells?’ The researcher says, ‘Yes’. That is it. If the researcher says, ‘No’, then his application will not be accepted. So he says, ‘Yes’. (RS1)

The issue of respect is complicated in Japan by the convention in Japanese hospitals and companies to organise a ceremony (o-kuyo) for laboratory animals once or twice a year. These ceremonies are performed by Buddhist or Shinto monks. The monk prays for the spirit of the deceased animals and conveys people’s gratitude to them for their service to humankind. Such a ceremony does not exist for embryos. And even though it has been a topic of discussion, it would not serve the same purpose. For, unlike the animals, the embryos have never been born as fully valued human beings; and, unlike the ceremonies performed for surgical needles and dolls, the donated embryos are not supposed to have been made with the purpose of serving people in an instrumental way.

From a different angle, RS1 also asserted that there is a strong argument against regarding the embryo as something very special: Many women use the pill. The pill has two effects. First, it inhibits fertilisation; second, it inhibits implantation. As often only the second effect occurs, many women discard embryos (RS1).

Values and sensibilities related to the embryo are rarely consistent when mindscapes built upon notions of family-making clash with bench work on the embryo, causing hands-on laboratory scientists to ‘switch’ between mindsets. The views of research scientists regarding the relationship between the beginning of life, their research materials and the purpose of their work reveal the problematic aspects of keeping up mandatory respect in the daily routine of working with stem cells. RS2, from a laboratory in Kobe, is interested in understanding the mechanisms that maintain the pluripotency of stem cells. He hoped to understand how pluripotent cells are prevented from differentiating into specialised cells. According to RS2, life begins after the formation of what he calls the major body plan. He hesitated to describe an embryo as a clump of cells:

ES cells have the potential to generate one more individual and derive from an embryo that was originally meant to become a person in IVF cloning. That is why we need to respect them… At work, we do not need ceremonies or prayers; we just need to keep in mind their origin and potential. (RS2)

Less concerned with life’s origins and more with research rationale, RS3, from another laboratory in Kobe, believed that human life begins only after birth. Respect for the embryo, in his view, means that the researcher must have a valid purpose to conduct the research, and not, for instance, for the sake of becoming famous. In his opinion, hESR is too dangerous for human application, so that he prefers to stick to working on mice. Rather than thinking about ceremonies for human embryos, he would prefer the RIKEN ceremony for mice, ‘for saying thank you’.

RS4, from a Kyoto research institute, works with SM5, but his views are less influenced by the need to generalise. When asked about the beginning of human life,
he argued that life begins ‘at monogokoro, when the child is 3–4 years old’ (transl. MSF). This is the time at which children are thought to become self-conscious. Assuming that RS4 was thinking about his own life experience, I asked him about the points of view of parents. ‘At pregnancy’, he replied straight away. According to RS4, the embryo possesses a spirit, and treating the embryo with respect means expressing gratitude, but not through any kind of formal ceremony.

A similar absence of engaging with the topic in a consistent manner comes from RS5, senior researcher in the Strategic Research Planning and Management Division of the Research Headquarters for Developmental Biology at Tanabe Pharmaceutics in Osaka. According to RS5, human life begins at fertilisation. His view of life ascribes spirit/mind to a foetus of roughly six months old. The spirit, he believes, is formed through an educational process. RS5 defines the concept of spirit very broadly: ‘When you touch animals and they react, then they have spirits too.’ Even though RS5 agrees with the suggestion that there should be a ceremony for the embryos in his institute, he has no confidence in scientists’ ability to defer to the embryo on a daily basis: Researchers in the laboratory treat samples with respect in the beginning. Gradually, they are ignored. Routine research. It is difficult [for them] to bow each time (RS5) (Trans. MSF).

These research scientists have not practised putting forward a consistent view on how to value the embryo incorporating various points of view. Instead, they switch social mindsets. By contrast, science managers try to avoid contradiction when discussing various social perspectives on the embryo. Research scientists are not experienced in presenting their views on the embryo and, when asked about its meaning in family life, some mentioned that ‘life is full of contradictions’. Moreover, research scientists were less concerned with appearing politically correct, regarding a ceremony for embryos as interesting or silly, and none thought that performing a ceremony to please the public was appropriate. A consciousness of the origin of the embryo and its potential life, acquired during obligatory training, was widespread among the research scientists. To all of the interviewees, it made sense not to waste embryonic stem cells. Speaking of the embryo/oocytes in the context of the family, research scientists attached great value to its life potential. But ‘respecting cells’ as a mandatory part of daily routine, apart from in terms of scarcity, was not seen as a part of professional life. In the context of laboratory work, a different set of values came to the fore, constituting the distinct social mindscape of laboratory scientists.

Discussion: Social Mindscapes of Scientists, and Public Discussion on Embryonic Value

Although reproductive materials such as embryos, oocytes and semen are discarded in some contexts as rubbish, they seem to be greatly valued in others. As argued by Arjun Appadurai, ‘things’ have social lives (1986, p. 15), they undergo value changes depending on their socio-political context of exchange. Just as any object,
the embryo has to be disentangled (Callon, 1998, pp. 36–37) from its natural producers (the prospective parents), its prior context and its environment before it can be transformed into a gift, donation or commodity. Embryos, when regarded as a source of life and hope, are carriers of symbolic values that acquire meaning in the context of particular social mindscapes and mindsets. Thus, what is referred to as ‘waste’ depends on the value regimes under which the concept is used, and those value regimes change over time (Douglas, 1986; Waldby and Mitchell, 2006), together with the social mindscapes in which they acquire meaning.

Social mindscapes are not just webs of meaning in which humans are suspended (see Geertz, 1973, p. 5); the webs are spun by social actors, providing the cognitive material through which they further their interests. But research scientists’ views on the embryo express differently across the social mindscapes associated here with home and work, and are not the result of strategic performance, as implied by the concept of the rhetoric of scientific boundary-making (Gieryn 1983, Cunningham-Burley and Kerr, 1999). They result from scientists inhabiting different mindscapes. Similarly, the seemingly consistent views of science managers are not merely a result of strategic thinking, but derive from careful considerations and affinities with different mindscapes. They form a person’s social complex of identities or ‘partial connectedness’ (Strathern, 1991). Compared to research scientists, however, science managers are keener on furthering their interests by articulating their and other people’s views of the embryo. Research scientists maintain the boundaries between science and society and deal with the various mindscapes they inhabit through what can be called mindset switching. Science managers, however, try to incorporate social, non-science aspects of the embryo into their well-argued views, which are partly instrumental in managing hESR projects. But the appropriation of other, diverse social mindsets fragments the mindscapes of research managers as narration, losing their symbolic meaning. Instead, this research shows that science management borrows the empty husk of ritual and meaning of ‘respecting the embryo’ to fashion new notions of bioethics research regulation. Based on compromise, science managers straddle and negotiate the boundaries between science and society to conflate them in bioethical guidance. But this convergence is forged without incorporating the various social mindscapes prevalent also among other scientists, and thus without actually negating the boundaries between science and society.

As I noted when introducing the concepts of social mindscene and mindsets at the end of the introduction, the boundaries between science and society created as a part of discourses on the regulation of science and its relation with society are not necessarily a product of rhetoric and political strategy. We can now see how the concepts illuminate the reality of the multiple social environments and cognitive worlds that stem cell scientists inhabit. Although the professional situation of science managers in Japan may have encouraged them to take a strategic stance and create new mindsets from the various social mindscapes they inhabit and construe, they also share the multiple social mindscapes with research scientists in the laboratory, whose views of the embryo in the context of home and work was substantially different in contents and formulated with less consistency compared to the views
of science managers. Debates on the boundaries between science and society, then, should not be informed merely by a strategic concept of boundary-making. It should be complemented by one based upon the social mindscapes scientists inhabit and the mindsets through which they construct and express their views.

All scientists interviewed expressed the wish for clear regulation though they were motivated variously: the lack of regulation would lead to underground practices (SM1), lead to insecurity among researchers, and was believed as necessary for setting limitations to the experimental excesses of scientists (SM3). According to the vast majority of the interviewed scientists, regulation would have to be based on the outcome of public discussion. The main reasons given for this included the view that public discussion would augment public trust, vindicating research—it would make it easier to attract funding, and it would increase the number of donors.

The questions of who leads public discussion and the credibility of scientists’ views, therefore, are important. Scientists are influential in the debate on hESR, and it can be too easily assumed that there is just one dominant view among scientists about the embryo. On the basis of the analysis above, it becomes clear that the jobs of science managers and research scientists make different demands on the thinking of scientists, and lead to different ways of formulating views about the value of the embryo at home and in the laboratory. Depending on their social mindscape, science managers moved easily between mindscapes pertaining to the family and work (that is, management). Research scientists, however, switched abruptly from a socio-cultural ‘home’ mindset to a laboratory mindset, enabling them to focus on the job at hand. Despite their awareness of the bioethical need for respecting the embryo, working with hES cells on a daily basis, according to research scientists, could easily become part of a daily routine.

A strategic attitude towards the handling of embryos, such as adopted by one science manager, enabled the incorporation and objectification of the donors’ wish to respect the embryo by performing ritual at their ‘demise’. This, one science manager (SM7) did by incorporating the thoughts belonging to the social mindscapes of donors into his thinking, without making it part of his own world and experience. But what does it mean for the public discussion if the demanded respect and ritual belonging to the social mindscapes of a group of donors are not, and cannot, be felt by the scientist responsible for the future of the embryos? This occurrence of mind-scape switching may also have consequences for the trust that the public invests in scientists’ capacity to empathise with the social mindscapes of donors. But what if all scientists, similar to SM4, who thought that foetal research is grotesque and wasteful, would refuse to take into account mindsets other than their own and recognise only one ‘correct’ mindscape, though self-consciously compromising it in daily life/work? If all scientists, including those in the laboratory, were independent and powerful enough to do this, what would this mean for the public debate on hESR?

The switching between social mindsets, then, raises a number of questions for the public debate on hESR. The question arises as to which of the different kinds of scientists are represented in public deliberation. Usually, it is the voices of science managers that are heard, but it is the research scientists who handle embryos.
Research scientists have different views of the embryo in the social contexts of home and work, switching mindsets when moving from one sphere to the other. If the research scientists do not respect the embryo in a way expected by the donors, which requires the integration between mindsets associated with different social mindscapes, what does it mean when guidelines speak of respecting the embryo? What are the implications for the decision-making of potential donors of embryos? And, if science managers know how to present an integral view of the social mindscapes they belong to as family members and members of the science community, but only pay lip service to donor views of the embryo so as to get on with hESR, what are the consequences for the credibility of science managers, who play a major role in the debate on hESR?

NOTES

1. The three ministries that issued the guidelines were the Ministry of Education, Sports, Science and Technology (MEXT), the Ministry of Health, Labour and Welfare (MOHW), and the Ministry of Economy, Trade and Industry (METI).
2. For comparative materials on the regulation of human embryonic stem cell research in Taiwan, Mainland China, South Korea and Japan, see M. Sleeboom-Faulkner and S. Hwang (2012). For a comparison between countries with permissive and stringent regulation, see the World Stem Cell Map (MBBNet, 2013).
3. Well-known PIs usually partner with a laboratory leader: Nakatsuji with Suehiro; Umezawa with Akutsu; Ohgushi with Hirose; Yamanaka with Takehashi. But some have various counterparts in the laboratory, such as Nishikawa, Nakamura, and Tokuchida.
4. Fleck defines thought collectives as ‘a community of persons mutually exchanging ideas or maintaining intellectual interaction’ (1979, p. 39).
5. As RS1’s mindscape of the laboratory played a vivid role in his current thinking, I designated him as RS.
6. Similar to scientists in the UK (Mori, 2001).

REFERENCES


