The 'Imagined Publics' in Science Policy: A Study of Public Engagement around Advisory Committees

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Declaration

I, Tadafumi Kubota, confirm that the work presented in my thesis is my own. Where information has been derived from other sources, I confirm that this has been indicated in the thesis.

Abstract

This thesis reveals how different social imaginaries of publics can be constructed around science policymaking practice in different countries. It explores how conceptions of legitimacy can contribute to the construction of publics and their concerns. STS scholarship that explored the struggle for coexistence and coordination of public insights and scientific advice at the national level in the science policy arena has successfully explicated how scientific expertise is incorporated in a culturally specific manner into collective decision-making. Nevertheless, these perspectives have still been influenced by a cultural bias of highlighting legitimacy regarding the input process, which particularly prevails in Western democratic theories. Also, previous studies have paid insufficient attention to the engagement of administrative staff, dismissing them as merely a machinery of policymaking practices or, conversely, treating them as authoritative power, mixing them with other political elites as an oppositional monolith to the public.

Reflecting on a comparative case study of policy discourses regarding ethical and regulatory issues around emerging germline genetic intervention technologies in Japan and the UK, the thesis reveals that these two societies, both with a liberal democratic culture, emphasise quite different forms of legitimacy as well as responsibility in policymaking practices. This research also reveals the involvement of administrative staff in the materialisation of these conceptions.

Furthermore, I argue that the difference in legitimacy and responsibility plays a critical role in how the views of citizens are incorporated into and excluded from policy decision-making, as well as how civil servants or other administrative staff engage with policymaking processes. This perspective not only helps our understanding of the non-Western culture of scientific expertise and democracy but also provides a more detailed description of the analysis of science policy-making across different political

cultures as another foundation for comprehending public engagement in science and technology.

Impact Statement

Despite persistent arguments for public engagement in science and technology from political and academic perspectives, there is still a struggle for the coexistence and coordination of public insights and scientific advice in the actual national-level science policy arena. In this regard, STS scholarship has successfully explicated how scientific expertise is incorporated in a culturally specific manner into collective decision-making. Nevertheless, their perspectives have still been influenced by a cultural bias of adhering to the legitimacy in the process of knowledge or opinion-input, particularly prevailed in Western democratic theories. In addition, the previous studies have paid less attention to administrative staff, dismissing them as mere machinery of policymaking practices or, conversely, have treated them as authoritative power, mixing them with other political elites as an oppositional monolith.

Findings presented in this thesis through a comparative qualitative case study demonstrate the existence of the social imaginaries of the publics constructed around policymaking practices on biotechnology, coined as 'the Imagined Publics', in the UK and Japan. Through the analysis of the Imagined Publics in each country, the thesis further reveals the variation in how a given society stresses the type of legitimacy of decisions as well as responsibility for them in policymaking practices, which I argue is quite contrasting even among liberal democratic cultures. These results, which cast a light on the hidden cultural factors contributing to how and why the publics as well as science are situated as such in each society, will provide a foundation for comprehending the cultural influence on science policymaking from more fundamental perspectives than previous studies. It can be of importance for future research that attempts to compare science policy in different political cultures, particularly one that involves non-Western political culture. Therefore, this perspective does not benefit only STS

literature but also potentially wider academic genres such as political sciences.

Moreover, this research also discloses the involvement of administrative staff in the materialisation of these imaginaries into concrete policymaking exercises. In combination with the aforementioned results, this finding could highlight the importance of the involvement of public officials and other administrative staff in altering the Imagined Publics through public engagement in science policy practice, and eventually allowing public views to influence science policy. This could provide an improved perspective in approach for effectively institutionalising public engagement practice in science policy with substantial influence, which can be of empirical help to a wider range of people surrounding the science policy arena, not to mention those who are inside the core arena, such as policymaking practitioners or public officials who seek to incorporate more public views into science policy.

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Chapter 1: Introduction

Background: Motive for the Study

'Hey, we civil servants never make decisions for ourselves, neglecting citizens, don't we? The public always falls in our scope of consideration when we work. We are thinking of the public'. This comment, which came out of the mouth of my colleague in the governmental ministry in Japan, could have given me the overall direction for this doctoral thesis. It might be a bit autobiographic, but before getting down to the main part, the motive for the study could be worth an introduction.

This thesis stems from a somewhat innocent question of mine about the distance between actors in the science policy arena and the whole society or the so-called general public in Japan. More high-sounding, it could be about technocracy, one of the familiar forms of the neglect of the publics in science policy. It mainly came from my personal experience as a government official who works in the ministry in this country. For example, while the emergence of genome editing provoked a strong call for the inclusion of public views in the technology at the global level (see such as Jasanoff & Hurlbut, 2018), the Japanese government has kept rather silent about the call (I will address the topic later in the main chapter). Then, what produces barriers between science, policy and people?

Many readers might assume these are stale, worn-out questions that have already been profoundly investigated widely across disciplines. As I explain in my literature review, the tremendous collection of studies has elucidated the problems of science policy-making that exclude the people on the street and, more fundamentally, the importance of social intervention in scientific development. In this regard, social constructivism provided the foundation of and made a significant contribution to the argument. In particular, the mid to late 1990s saw the emergence of arguments that

question the deficit model of science communication and technocracy, which prioritises the knowledge established exclusively within the scientific community. In so doing, science in society became no longer an isolated sanctuary secured to *scientific* people. Scientific controversies that simultaneously happened in European countries, such as the BSE crisis or social concerns over GM food, accelerated this momentum, which reached its culmination at the societal level in the 2000s in the argument for dialogues between experts and people as an essential condition to establishing socially acceptable policies that command the confidence of the general public. This momentum also had the wind at its back, the wind that came from the emerging argument for deliberative and participatory democracy that stressed more on the input of the publics' opinions in decision-making procedures. Salomon's phrase, 'Neither science nor the institutions of science are democratic systems. They are obviously far from being democratic' (Salomon, 2000), could have become a somewhat common catchphrase for the criticism of technocratic decision-making in science policy in the Science and Technology Studies (STS) field.

At the same time, we also know that this momentum has not proceeded without obstacles. Many recent studies in science policy argue that such public engagement practices have little influence on the subsequent science policy decision-making, which is still in favour of scientific progress (see such as Smallman, 2015). Some criticise the dominant influence of scientific experts (Welsh & Wynne, 2013), and others point out the alignment of science and policy elites (Bora, 2010). These studies furthered their scrutiny of the black box of science policy-making–for example, the step between the input by the publics and the final policy outcomes provided that directly influence society, calling it 'throughput' (Iusmen & Boswell, 2017; Schmidt, 2013).

Japan, one of the countries that recognise themselves as 'a scientific and technological nation'[1], was no exception. In the 2000s, following the Western trends above, there were several government-led public engagement activities that tried to open the decision-making process for non-experts (Nishizawa, 2005; Yanase, 2016). Following the Western trends of democratisation of science (see Barns, 1995; Guston et al., 1999; Purdue, 1999), they imported arguments that were well-known in the theories of democratic governance of science, such as that science and technology, as well as policies encompassing them, are not only for scientists or those taking part in the arena; that they need governance at a societal level and; that more scrutiny by ordinary citizens who are not deeply involved in very scientific topics is needed. In other words, we could say there had been an inferiority complex, in which a country that is less mature in societal terms needed to catch up to the global standard.

Accordingly, the movement in this country faced a deadlock, even more strikingly than one in Western society. In particular, terrible catastrophes related to science and technology happened in Japan, which resulted in disclosing an invariable exclusive atmosphere in policymaking among experts and core stakeholders. One specific example could be the Fukushima nuclear accident caused by the magnitude 9.0 Great East-Japan Earthquake and the subsequent tsunami, which has been widely analysed by Japanese STS researchers (see such as Fujigaki and Tsukahara 2011). In their studies, or even in society as a whole, the technocratic governance of science and technology attracted a wide range of criticism.

As a consequence, there were some movements that had not been commonly seen in the previous daily life in the country. In particular, demonstration calls against nuclear energy policy claiming democratic decision-making that involves people's voices became everyday events in front

[1] Japan, Cabinet Secretariat. (2022. June 7). *Grand Design and Action Plan for a New Form of Capitalism ~Investing in People, Technology, and Startups~.* 52p.

of the Prime Minister's Office. Looking back to the previous social status of demonstration activities in Japan, which had lost its position before the accident, some scholars in the country positively evaluated these activities with remarks with somewhat aggressive terms such as '*Join a demonstration, or you are a monkey* […] Japan needs to be a country where demonstrations take place every day', [2] or 'Japan is abnormal among developed countries in terms that the culture of direct protest had ceased […] The fact that a culture of political participation has been established to a certain level should be honestly commended.'[3] There were comparisons with the common sense in foreign cultures, in which they placed the domestic environment in an inferior position.

Nevertheless, with the concern about a somewhat universalistic notion that dismisses the difference in cultural backgrounds, I would like to cast a question on their utilisation of the one-way ruler of democratic maturity in society that ranks each society. For instance, some surveys suggest that Japan as a whole does not seem to agree with the experts' opinions toward demonstration. RENGO (the Japanese Trade Union Confederation) recently published the public opinion toward social movements (RENGO (JTUC), 2021), in which more than half of respondents feel negative impressions (annoying or frightening) toward demonstrations. According to the survey, people felt a distance from demonstration practices, even though the majority of them were willing to join social movement activities. It should also be notable that this result was published by the largest national trade union centre, which has affiliated with anti-conservative political parties that are in favour of social activism. It could be possible to employ enlightening articulation to describe that people in the country have not yet been aware of the importance of activism. On the other hand, we could also interpret this as suggesting a potential pitfall of dissemination of a standard in the perspective of Western democracy, which positively praises demonstration, to other

[2] http://www.kojinkaratani.com/jp/essay/post-64.html
[3] https://www.tokyo-np.co.jp/article/151768

cultural circumstances. In other words, it could indicate the latent universalism in the conception of democracy.

In this regard, genome editing and shocking reports regarding the use of the technology, which has sparked controversy at the global level, also led me to pay attention to cultural differences. After the scandalous report of the world's first genome-edited baby birth in China, there has been 'worldwide outrage' against the research group that conducted the experimental project[4]. I understand that there were many foundations for such accusations (Morrison & de Saille, 2019). However, what is the difference from the announcement of a green light for the use of mitochondrial transfer in human embryos in the UK (Callaway, 2016), which took place more than two years before the report? Could we fairly demonstrate that the criticisms against the Chinese research team are completely free from cultural bias that regards China as a late-comer in the science and technology field who does not follow the global standard of ethical consideration? I am clearly not in a position to defend or protect the group's conduct of technology application to human beings here, but we might also want to pay a little more attention to the voice from China, such as some arguments of Chinese researchers that 'China also has a well-developed regulatory framework governing such research comparable to many developed countries' (Zhai et al., 2016). More precisely, we could pay more attention to the norms or legitimacy behind the construction of the difference in the governance framework of science and technology.

Some prior comparative survey data across countries seem to champion my exploring cultural differences in the legitimation surrounding science and technology. Wellcome Trust, a charitable foundation focusing on health research in the UK, analysed how people around the world think and

[4] See such as: Science Business. (2019. Jan 08). *In the eye of a science storm: China's genetically edited babies scandal, and what happened next.* https://sciencebusiness.net/news/eye-science-storm-chinas-genetically-edited-babies-scandal-and-what-happened-next

feel about science in 2018 and 2020, before the outbreak of COVID-19 and just after it, or more precisely, at the time of chaotic confusion regarding how to tackle with the infectious disease[5]. The two reports could show the influence of what people learned at the beginning of the pandemic, that is, the fact that science at the moment cannot provide an answer for clear-cut decisions like a textbook or an encyclopaedia but rather is still in the ongoing process of knowledge-making[6].

Of particular interest is the difference among countries in the relationship between the change in the trust in scientists and how much people generally think they personally know about science, as shown in Figure 1.1. If we count the ratio of people who trust scientists 'a lot' or 'some' (i.e., who positively answered the question) as trust in scientists, only Japan saw its overall decrease, disregarding how much they consider they know about science, which is completely opposite from other countries. Moreover, the lower they acknowledge their level of scientific knowledge, the sharper the decline we could see in the trust of scientists. It was strikingly different from the situation in the Western countries, where these two indicators show a more or less inverse association between each other.

[5] For more detailed information or methodology on the survey, see the report of each study: Wellcome Global Monitor 2018, https://wellcome.org/reports/wellcome-global-monitor/2018; Wellcome Global Monitor 2020, https://wellcome.org/reports/wellcome-global-monitor-covid-19/2020

[6] This method for the examination is adopted from the comparative analysis conducted by NISTEP, the governmental research institute on science and technology policy in Japan (https://www.nistep.go.jp/sti_indicator/2022/RM318_58.html).

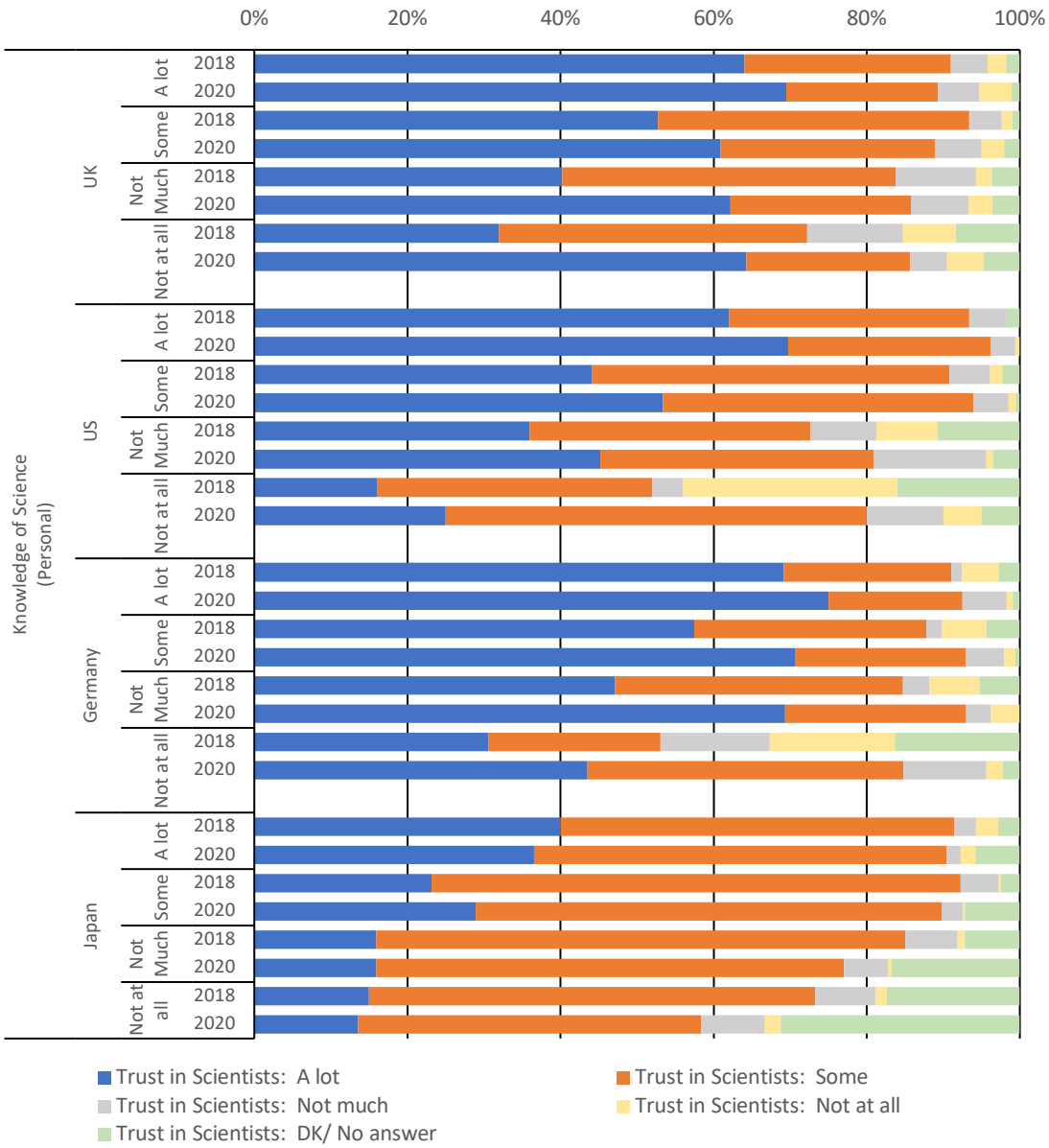

Figure 1.1. The trust in scientists before (2018) and after (2020) COVID-19 outbreak
(Graph was drawn by author using Wellcome Global Report 2018 and 2020)

What does the vivid contrast indicate? Even though it is usually necessary to provide a much deeper analysis and consideration of the result for comprehension, such opposing results and extraordinary background conditions would not require such a complicated discussion. First of all, given that people in any country had gone through the experts' trial and error in the knowledge-claim making and governments' chaotic measures against the pandemic crisis of COVID-19 during the interval between the two surveys, the shift in the trust in scientists should be mostly attributed to the

impression of people toward the unsuccessful approach in coping with the pandemic guided by scientists. If so, we could argue that the fact that scientific knowledge at that time could not lead to a *successful* resolution negatively affected the reliability of scientific experts in Japan; frankly speaking, once they failed to provide a foundation of clear (and perhaps satisfactory) decisions, they lose their trustworthiness. Answers by those with a lower level of self-recognition of understanding science could provide more nuanced implications. They suggest that these people evaluated scientists less depending on a scientific perspective and more on their general attributions. Combined with this assumption, the data indicate that the limitation of possible factors for consideration even facilitates the disappointment in scientists based on their unsuccessful coping with the pandemic. Admittedly, the data themselves cannot directly answer why a group of people regarding themselves as knowing less science showed a more positive change in their evaluation of scientists in the Western countries. Nevertheless, these observations could suggest that my concern regarding the difference in social legitimacy is rather commonly seen between the Western democratic countries and Japan.

All the more for the studies above, it is interesting to think again about my colleague's remark. Unlike elite interviews, in which we must be careful about the reliability of the answers and need to keep in mind that respondents do not always tell the truth (Berry, 2002), his casual, frank mention to his colleague in everyday conversation suggested he and his colleagues never place the public totally out of their scope in their daily practice. Actually, my personal experience as his colleague also let me hold a sort of empathy with his notion. The more I read the previous studies, the more I got confused by the gap between the real and theories, which led me to explore the possible explanation to bridge these separated perspectives. If policy actors think of *citizens* or *the publics*, then who are 'the publics' they think about? How do they communicate with policy actors? His comments suggest that such a relationship was not arbitrarily coerced but rather developed in mutual

interactions or as a social practice. If so, the questions above were no longer my subjective psychological conflicts but became more general inquiries about the social structure. In so doing, the quote at the beginning of this chapter drove me to conduct a detailed analysis of the policy practice.

It should also be of academic interest that the arguments for democratic decision-making in science policy, which stem from the criticism of universality in science, might fall into the very universalistic imposition. If so, we need to investigate a possible gap in logic between the theory of social constructivism of science and the conception of (western) democratic governance of science. In this regard, we should remember that STS has already recognised and investigated the problem with the universalistic application of concepts. Therefore, I have great expectations of the STS scholarship and adopt its approach in examining the connection and (possible) inconsistency between the two theoretical arguments.

The Aim of the Thesis and the Structure

The thesis aims to explore the importance of cultural differences in the context of democratic governance of science and technology, or in more particular, public engagement in science and technology (PEST). It pays special attention to the role of science and so-called laypeople in science policy practices, as well as the involvement of civil servants or other administrative staff.

Chapter two gives some consideration of theoretical insight from existing studies regarding this issue. I mostly employ the works of STS, but I will also borrow ideas from political sciences and sociology, both of which have an affinity with the STS scholarship, especially regarding science and policy. The aim of this chapter is to understand the theoretical foundations for public engagement in science and technology and possible space for further

investigation with respect to cultural differences, which this thesis aims to dig into.

Chapter three provides the methodological grand design for the thesis. First, it determines the hypothetical claim of my research in accordance with a critical realist manner by paying attention to epistemological and ontological perspectives. Second, for the analytical framework, the chapter provides theoretical foundations surrounding social imaginary. Then, establishing working research questions, the chapter defines the methodological approach adopted in this thesis. The Imagined Publics, which is stated in the title of the thesis, is introduced here as the analytical lens for the following case study. This chapter also introduces the cases and other sources of data for the analysis in the following chapters.

Chapters four and five examine the policy deliberations on the mitochondrial replacement technology (MRT) in the UK and policy controversies over embryonic genome editing in Japan, respectively, for the purpose of a comparative case study. Each chapter traces the policymaking processes in a chronological manner, mostly through document analysis of minutes and interviews with those engaged in the processes, aiming to elucidate the Imagined Publics as well as imaginaries of other actors that comprise science policymaking practices. The investigations are descriptive and focus on how these actors were situated in the policymaking practices. In addition, the chapter also attempts to disclose the association of the notions of social legitimacy and responsibility with the discourses, which constitute the key variables in cross-cultural comparison.

Chapter six pulls together the evidence and arguments presented in the earlier chapters to answer the research questions. It considers the differences observed in the two cases, particularly paying special attention to the notion of social legitimacy and associated conceptions of responsibility to a given society. Through this comparative approach, the chapter tries to

demonstrate my hypothetical claim that the mechanism of the construction of the imaginaries surrounding science policy in a country has a crucial correlation with the notions of legitimacy and responsibility shared in the nation.

In the concluding chapter, *Chapter Seven*, the thesis revisits the findings in the previous chapters again and provides some speculative discussion. Drawing from the results of the case study analysis, it proposes a reconsideration of the predominant paradigm laid under PEST. Challenging this well-studied, established conception might appear impudent; nevertheless, the thesis offers meaningful suggestions that the importance of each of the three principles of democracy–of the people, by the people, for the people–is not universal in practice. Then, it casts a question: If STS literature argues that how science is situated in society is not universal (Jasanoff, 2005c), why do we not consider the democratic governance of science could be different among cultures? I believe that this question could let us go a step further than conventional perspectives on the social governance of science and technology, which could have been largely rooted in the Western democratic framework. On the other hand, while refusing to apply the hierarchical or good-or-bad rating among these differences, the thesis neither appreciates the current relationship between science and people as it is nor argues that it cannot change. Back to the conception of social imaginary, I suggest a possible approach to enhance the involvement of the people in the development of science.

The following chapters try to anatomise the entanglement among science, policy, and people working in and around those realms. True, science in society cannot be an untouchable sovereignty, and we need to acknowledge the importance of social interventions in science, or more precisely, the intertwined relationship. On the other hand, there is not always only one direction to secure the involvement of different perspectives in society. In fact, such an idea does not come out of the blue; there are some options in

weighting the importance among three concepts, 'of', 'by', and 'for' the people, in decision-making at the governmental level, as introduced later in this thesis (Scharpf, 1997, 2003)–in other words, the aim of the thesis can be summarised to explore the variation in which a given social system weight the three ideals, which should be highly associated with the cultural context.

The thesis does not hold a particular position toward the utilisation of science. Before the exploration, however, it should be remembered that the research is highly motivated by my personal experience in working as a civil servant in the Ministry of Education, Culture, Sports, Science Technology, the governmental organisation in charge of policymaking regarding science and technology in Japan. Certainly, I recognise the failure of civil servants in this country to show respect to people on the street in their policymaking. At the same time, the working experience inside Kasumigaseki (a jargon corresponding to 'Whitehall' in the UK) has led me to embrace discomfort toward the previous arguments in the democratic governance of science that involve somewhat one-sided criticism of government officials. I must admit that this sort of subjective antipathy cannot be completely eliminated from my analytic attitude, which can imply that the resulting argument could be biased. Nevertheless, I believe that these analyses could provide some important suggestions for STS research in science policymaking.

What will the Imagined Publics provide for us? The thesis will reveal that even policymaking practices without public engagement or any other inclusive activity embrace the Imagined Publics in the very decision-making process. However, it should offer more–the articulation of the Imagined Publics could uncover the legitimacy of decision-making, the responsibility of public authority or decision-makers to society, and how science and technology are entangled with the aforementioned two conceptions, which are deeply embedded in everyday activity in the policy arena. These descriptions could enable us to comprehend how citizens are treated in the policy arena, which could provide a more tailor-made approach to PEST in each society.

Back to my colleague's comment referred to at the beginning of this chapter, the thesis is not just for saying to him, 'Yes, you're right. We are thinking of them, citizens'. Rather, it will encourage me to continue that, 'So, let's think together how we can collaborate with them to develop a better governance of science and technology'.

Chapter 2: Literature Review

As previously stated, this study's ultimate goal is to uncover the hidden influence of cultural factors enveloping the science-policy milieu regarding the neglect of public insights. I understand, however, that numerous studies in STS have paid attention to cultural differences surrounding science policy. Therefore, it should be imperative to clarify *what cultural factors are at stake.*

To begin with, I will provide a quick review of the trajectory of science policy, commencing from the early introduction of scientific advice to the arguments for public engagement, with reference to their theoretical underpinnings. Subsequently, I will address the recent struggle in PEST and the analyses of the reasons behind it. Then, I will identify two lacunae in these arguments, both of which mirror the cultural contexts in a society. The first pertains to the inattention to the unique commitments of civil servants and other administrative staff in science policy. The second gap is about the oversight of how community members perceive the decisions as legitimate. These lacunae will be the focal points of my research, which will be detailed in the following chapter.

2.1. A Prehistory of Science Policy

Scientists as Policy Advisors

Since the last century, especially after World War I, the landscape of science and technology, including their relationship with society, has undergone dynamic changes, particularly in Western countries. It became nearly impossible to comprehend our modern society without considering the role of science and technology. In the policy arena, the widespread use of science in society has led to the flourishing of 'scientific advice in policymaking' alongside the increasing prevalence of scientific knowledge (Brooks, 1964). With the advancement of science and technology,

policymakers (including politicians, civil servants, and arm-length or non-governmental regulatory bodies) have found it increasingly challenging to address policy issues without specific professional or technical expertise (King, 2016). In this way, scientific advisors got involved as an additional cast in the science-policy drama.

In the early days of scientific advice in the Western political culture, advisory committees were thought to parallel the bureaucratic hierarchy within the structure of government, with the critical function of *bypassing the bureaucratic channels*, allowing new ideas from outside the government, regardless of the level of the original proposer, to reach the place for decision making without undergoing the processes of time-consuming bureaucratic hierarchy (Brooks, 1964). At that time, scientific advice was viewed as the provision of independent, objective knowledge concerning science and technology. Scientific advisors and advisory committees they comprised were expected to 'speak truth to power' (Hoppe, 1999; Wildavsky, 1987). Concurrently, the scheme of scientific advice had also spread with the hope that this would provide a perfect basis for decision-making and free policymakers from conflicts once scientific knowledge accumulated to a certain level (Lane, 1966). Millstone (2009) characterised this relationship between science and policy as the 'technocratic model', which insisted that scientific and technical considerations were necessary and sufficient for making policies. This image of the dichotomy between science and society, or more precisely, the dominance of science over society, was rampant in the Western world during the 1950s and early 60s.

Problems in the Conventional Style of SACs – What Is a 'Good Advisor' All About?

Contrary to Lane's optimistic expectations, the increasing advancements in science and technology have revealed that such a romantic image of privileged scientific expertise, as well as the underlying uneven power balance, does not always work out successfully. It is mainly due to an

incomplete or problematic function of the 'technocratic model' of scientific advice on policymaking.

One notable event was the Bovine Spongiform Encephalopathy (BSE) crisis, which happened in the UK during the 1990s (Phillips et al., 2000; Stilgoe et al., 2006; Zwanenberg & Millstone, 2001). This tragedy elucidated mainly two problems in scientific advice: internal challenges within scientific advice itself and external ones in its relationship with policymakers. Regarding the former, it revealed that scientific advisers had dismissed several critical pieces of evidence from farmworkers as 'unscientific and largely anecdotal', which later proved pivotal in tracing the cause of the uncertain disease (Stilgoe et al., 2006). This assumption illustrates one of the flaws in the technocratic model, which excludes other notions from the scientific circles with shared technical knowledge.

The latter problem can be further delineated into two ostensibly contradictory parts. Firstly, this crisis illustrated that the perfect image of scientific advice and technocratic policymaking practices allowed policymakers to evade their responsibility, utilising advisors as scapegoats rather than making the best use of their expertise. Throughout the catastrophe of BSE, Agriculture Ministers tried to reassure people that British beef was 'perfectly safe' (Zwanenberg & Millstone, 2001), and scientific advisors were forced to play the role of government mouthpiece (Stilgoe et al., 2006). Secondly, policymakers expected scientists to be convenient tools for supporting their political decisions rather than relying upon their expertise. This attitude of policymakers can be encapsulated in Winston Churchill's speech that 'Scientists should be on tap, but not on top'. While this seems consistent with the criticism of technocratic policymaking, it has a severe risk of bending scientific advice according to policymakers' agenda (Stilgoe et al., 2006). These problematic relationships between science and policy can be seen in other policy fields, such as evidence-based policy making (EBPM), which insists on incorporating more 'rational' scientific

evidence into the policymaking process. Similar to the problems in scientific advice, such a movement in political science tends to be twisted into contriving to create evidence according to policymakers' will, ironically called 'policy-based evidence' (Sanderson, 2011; Strassheim & Kettunen, 2014).

We have also observed instances where scientific theories or arguments could be influenced by scientists' own particular political inclinations (Scheufele, 2014). In 2002, an article in *Nature* by David Quist and his supervisor Ignacio Chapela, which demonstrated the contamination of transgenic corn into the native environment in Mexico, sparked intense controversy within academic circles (Jasanoff, 2003b; Sarewitz, 2004). While their methods and conclusions were criticised intensively, their disputes were derived from the more general controversy over genetic engineering because this result, which could imply that the impact on GM crops cannot be controllable, had a potential threat to the future of the agricultural biotechnology business, and the research in the field. Pielke (2007) called this characteristic of scientists becoming more like stakeholders as 'issue advocates' and argued that when they try to guide a particular policy direction while claiming to 'focus on science' or pretending to be pure, neutral scientists, they could be 'stealth issue advocates', which could even confuse the meaning of scientific advice.

Beyond scientific advice, in line with these technocratic views, some scientists even sought to design social trajectories on their own, as if they were policymakers. One noteworthy instance was the 1975 Asilomar Conference on recombinant DNA, where scientists convened to discuss the potential risks to society and the proper management of the emerging technology (Hurlbut, 2015). This event evoked criticisms for its closed discussion wherein, as Senator Edward M. Kennedy articulated, they were 'making public policy… [a]nd they were making it in private' (Culliton, 1975). In this regard, many STS researchers or historians have focused on the scientists' attempt to protect their autonomy, freeing their field from social

and political interference (Guston, 2012; Jasanoff & Hurlbut, 2018; Weiner, 2001). However, there could be an extra rationalisation of why they believed themselves to be able to regulate themselves without governmental control. The participants recognised themselves as in the best and sole position to make decisions about the future trajectory of technology because they had 'special knowledge to recognise potential hazards of their research' (Culliton, 1975). They did not only fear the public intervention itself but did so because it could lead to 'unrealistic demands' from those lacking scientific understanding (Nelkin, 2001). In this way, the notion of power (or, more explicitly, the eligibility for participating in science policy) ascribed to the level of (scientific) knowledge has come to light. We have also seen this notion in other scenes of the science-policy arena.

More fundamentally, however, despite the absolutist belief in science, there is also increasing scepticism regarding scientific knowledge itself. Through his notion of 'the second stage of risk' in risk society theory, Beck (1998) explained that there is uncertainty that is incalculable or even unrecognisable, yet inescapable. In the face of such uncertainty, or when 'society becomes a laboratory', as Beck said, we can no longer rely on scientific expertise to automatically guide us in a single direction because such incompatible claims emerge from various actors, each defining risks or uncertainties in different ways.

These social problems linked with the 'technocratic model' of scientific advice provoked a new approach in science policy-making, namely 'public engagement in science and technology (PEST)'. In the following subsection, I would like to provide the theoretical grounds for this argument.

2.2. Public Engagement in Science and Technology (PEST)

As described in the previous subsection, the BSE crises or other scandals that happened in Western countries since the mid-1990s, such as

controversies over genetically modified organisms (GMOs), acted as a driving force for rethinking the unpleasant relationship between science and society within the 'technocratic model' of policymaking (F. Mali et al., 2012; Millstone, 2009), and subsequent argument for the democratic governance of science and technology. In this subsection, I will introduce the theoretical foundations for this argument, drawing from two different disciplines: STS and political science. Later, I will present some problems regarding these movements and arguments so far, which constitute a crucial viewpoint in my research.

The Theoretical Foundations for Democratic Governance of Science and Technology

From the perspective of STS – social constructivism and backlash against the 'deficit model' of public understanding of science

The term 'social construction' was initially used in Peter Berger and Thomas Luckmann's *The Social Construction of Reality*, in which they explained how stable social institutions such as human 'knowledge' are developed (Berger & Luckmann, 1966). According to them, such institutions and structures come to exist because of people's social activity, such as their actions and attitudes. While such institutions exist as if they were external objective reality because we cannot wish them away from our daily lives, they are nevertheless humanly produced, constructed objectivity (Berger & Luckmann, 1966).

Even though later STS imported the concept of 'social construction' from Berger and Luckmann's book, there was already a certain affinity with the theory in this field. In the 1970s, a group of scholars from the Edinburgh School of Sociology proposed the 'Strong Programme in the Sociology of Knowledge' (1976). The Strong Programme and SCOT shared a similar motivation to expand the explanatory scope of sociology to reality. Contrary to Berger and Luckmann, Bloor (1976) considered that this explanatory approach could be appropriate not only for the reality of everyday life but also for established scientific and mathematical knowledge. This notion provided

a ground for introducing the constructivist concept into investigating the relationship between science and society. Later, Bruno Latour's collaborative study with Steve Woolgar (Latour & Woolgar, 1986) explicitly embraced the constructivist perspective (as reflected in the titles of their book) and revealed that scientific facts result from discussion and agreement at the individual and interactional level. They radically argued that the conventional distinction between the natural and the social is fictional, and there is no longer 'scientific production' that is different from 'human affairs'.

A significant feature of the social construction of technology is its strong objection to 'technological determinism' (Bijker, 2009). Technological determinists view technology as developing autonomously and believe that the course of social progress is inevitably determined by technological development (Edgerton, 1999), holding an absolutist image of science akin to that of technocrats. On the contrary, social constructivists in STS argue that science and technology cannot be independent of social, cultural and political interventions. Rather, much like Berger and Luckmann, they contend that humans are involved in scientifically shaping 'true' claims or 'objectivation' of the representations.

Taking a step further, in his 'risk society' theory, Beck (1998) explained that scientific expertise now merely provides factual information about probabilities, not an answer to matters of value, such as which consequences are acceptable. In this regard, Beck argued that 'Nature is inescapably contaminated by human activity', and to resolve such risk conflicts in our current society, '[p]eople, expert groups, cultures, nations are having to get involved with each other whether they like it or not' because 'nobody is the subject and everybody is subject at the same time'. This theory aligns with Ezrahi's explanation of the trend against instrumental politics in our postmodern society from the perspective of political theory (Ezrahi, 1990). Similar to Beck's notion, he argued that this trend reflects a retreat from commitments to the value of rationality and objectivity or earlier trust in the

dichotomies between reality and fiction. According to Ezrahi, our society is no longer planned 'according to shared ideals of freedom, justice, and beauty' but rather 'like a gigantic condominium, a hedge-podge of diverse individual worlds'. Also, this pluralism rejects the notion that rational collective actions result from calculations made by a centralised authority with privileged access to relevant knowledge.

Accordingly, as scientific uncertainty permeates today's society, there is an increasing argument that political decision-making regarding technological issues should consist of the insights and considerations of all the groups in society and that the deliberation processes for decision-making must involve those concerned (Bijker, 2009). However, while the social construction theory of science and technology criticises technological determinism, it does not repudiate the impact of science and technology on society. Instead, it provides a mirror concept of the scientific and technological construction of society, including policy (Bijker, 2009). This theory rationalises the incorporation of scientific expertise in the policymaking process (Sismondo, 2010). In other words, the constructivist view transformed the communication between science and society from a one-way flow to a two-way exchange, not to reverse orientation.

The criticism of the 'deficit model in public understanding of science' has also provided the ground for introducing public engagement in science and technology. In his articles (Wynne, 1991, 1992), Wynne highlighted two recognitions within the model: that the publics lacks scientific literacy and that the one-way dissemination of knowledge for remedying this deficiency in scientific knowledge is necessary. Also, he argued that such recognitions could overlook the more mutual and complex relationship between the publics and scientific knowledge and lead to the assumption that the deficit in scientific knowledge implies a deficit in democratic capability. In this context, the term 'deficit model' can be regarded as a kind of ideological construction (Wynne, 1993), allowing the one-way communication from 'knowledgeable'

scientists to the 'ignorant' publics, or more broadly, from science to society. On the other hand, critics of the deficit model have elucidated that scientists and the publics have a 'different kind of practical and experience-based expertise' (Wynne, 2003), and the difference is 'rooted in different life worlds, entailing altogether different perceptions of uncertainty, predictability and control' (Jasanoff, 2003a). Accordingly, the rebuttal of the deficit model also provides a good rationale for involving the opinions and knowledges of the publics in the science-policy-making process, as well as fostering mutual communication between science and the publics.

Before moving on, I should mention the meaning of the plural forms of words such as 'public' or 'knowledge', which I have used without excuse. Studies in public engagement have shown that in today's society, where cultures are diverse and pluralistic, there are multiple 'publics' rather than a singular, homogenous 'public' (Dietrich & Schibeci, 2003; Wilsdon & Willis, 2004). This view aligns with a key commitment of STS scholarship, which pluralises expertise and knowledge along with different social groups (Wynne, 2003) or scientific disciplines (Irwin, 2015). Thus, the plural forms 'publics' or 'knowledges' are now used in STS and Public Engagement literature to emphasise this diversity (Flear & Pickersgill, 2013; Pidgeon et al., 2017).

From the perspective of political science – deliberative democracy and the conception of legitimacy and responsibility

A line of study in political science regarding democratic policymaking provides fertile ground for the meanings and significance of public engagement in scientific governance. Since the 1990s, increasing attention to the importance of direct democracy has brought about the arguments for 'deliberative democracy' in the policy arena. The concept's discourse-oriented approach resonates with science and technology studies on the democratisation of scientific expertise with several types of legitimacy while also indicating some drawbacks of public engagement in science policy-making.

Before exploring the meaning of PEST in the context of deliberative democracy, it is worth reviewing the fundamental political theories regarding democracy and its legitimacy. Consistent with its terminology derived from the Greek words ***Kratos*** (= 'power' or 'rule') and ***Demos*** (= 'people'), Scharpf described democracy as aiming at society's collective self-determination in political choice and requiring two concepts for its legitimacy: first, mechanisms or procedures should be generally responsive to the preferences of the publics ('*input legitimacy*'), and second, policy outcomes and results should meet the expectations and needs of the publics ('*output legitimacy*') (Scharpf, 1997b, 2003). Beyond other legitimating concepts of authority, such as religious, traditional, ideological, or charismatic premises, these legitimacies do certify the significance of democratic policymaking in modern Western society (also non-Western democratic countries such as Japan), at least theoretically or normatively. It is also of note that as subdivisions and delegations are quite common in today's social activities, this conception of legitimacy is not only considered in public action but also expands its scope to institutional authorities' actions (Schmidt, 2020).

If we adopt this typology, we could articulate the problems in conventional scientific governance with expert advice as follows: the lack of *input* legitimacy in the early science policy, which relied too much on *output* legitimacy through introducing professional expertise, later led to a paradoxical limitation or stagnation regarding its very output legitimacy of it. This sentence could exemplify the difficulty in categorising legitimacy in real-world issues based on the input-output legitimacy classification. In this regard, we also need to keep in mind the non-linear interlink between input and output legitimacy (Abels, 2007); that is, while both forms of legitimacies cannot exist in a stand-alone manner in the real world, we can see that it does not guarantee that pursuing output legitimacy can automatically improve input legitimacy, and vice versa. But for now, I adopt this theoretical categorisation to explore the difference in legitimacy.

The advent of deliberative democracy could be seen as a complement to representative democracy, which insists that a small number of representatives elected by the publics decide the political choice (Chambers, 2003; Goodin & Spiekermann, 2018). While most modern countries adopt representative democracy, mainly due to matters of scale, it has been subjected to a myriad of criticisms from supporters of direct democracy because of the limited opportunities for public involvement in policymaking– in a word, the lack of *input* legitimacy. Although an electoral process is employed to secure the democratic authority of elected representatives, this proceduralist scheme struggles to reflect the will of the publics in detail, given that today's society must deal with too many issues for a single representative can cover (Boedeltje & Cornips, 2004). With the re-evaluation of direct democracy in the 1960s and 70s, a new concept that tried to combine those two models of democracy, namely 'participatory' or 'deliberative' democracy, emerged in the policy field. This model embraces *the legitimate deliberation process* among various social groups, including 'lay publics', to enhance input legitimacy (Abels, 2007; J. Cohen, 1997).

While the term deliberation is defined differently by various theorists, the description by Bächtiger and his colleagues provides its minimal common definition: 'mutual communication that involves weighing and reflecting on preferences, values, and interests regarding matters of common concern' (Bächtiger et al., 2018). In other words, most, if not all, deliberation theories share the ideals of 'mutual respect' and 'absence of coercive power' as essential norms for input legitimacy (Mansbridge & Hartz-Karp, 2006). The former requires active listening and an effort to understand what other people think by their statements, not regarding them as something to be dismissed. The latter, 'the absence of power', is crucial in deliberation to eliminate the threat of sanction or coercive pressure to change participants' positions. These norms have gained resonance with the scholars of science and technology and let them argue that the citizens should open up science and

technology governance to the public sphere, exposing it to diverse arguments and scrutiny of the underlying assumptions that scientific experts have (Stirling, 2008). Therefore, these prescriptive accounts for input legitimacy require that any practice for achieving deliberative science-policy governance should meet at least two criteria: whether there is mutual respect among players and whether they are equally treated without the lopsided power balance.

While conceptually flawless, these normative criteria have several technical problems. First, although deliberative democracy aims to increase the substantive incorporation of public opinions, this scheme is sometimes criticised for its fundamental limitation of *output* legitimacy (Parkinson, 2003). Even under rational deliberation and thoughtful consideration of diverse standpoints, the ultimate decision has to exclude the voice of certain positions as long as it must provide a final direction (or directions) (Eagan, 2016). In addition, deliberative exercises that provide enough opportunities for meaningful citizen involvement are, in turn, exclusive of those who do not join the deliberation. Thus, there is concern about failing to match the desires of those uninvited, which could erode output legitimacy. If we ask participants in public deliberations to behave as representatives of those not involved, as some deliberative democrats have suggested, it could ironically risk reverting to the aggregative politics that deliberative theorists criticise (Lövbrand et al., 2011).

Second, due to its call for ideal and relatively abstract conditions, it is also difficult to establish practical and standardised procedures for policy practitioners. For example, if we adhere to the ideal of mutual respect, which implicitly stresses the plurality of views, we could fall into an endless search for sufficient pluralisation in policy deliberation, making it difficult to reach closure in real-life deliberations, which is essential for having a real impact on policy decisions (Lövbrand et al., 2011). In addition, although several assessment methods have been proposed (Roberts, 2004), it is still tough to

evaluate the impact of public engagement on policy output because there are difficulties in confidently attributing cause and effect (Culyer & Lomas, 2006). While such normative political theory is sometimes regarded as an evidence-free zone (Dryzek, 2007), some proponents of deliberative democracy tried to defend its justice by emphasising the by-products of the policymaking process rather than its input or output. They have drawn attention to other impacts, such as the development of participants' capacities (e.g., knowledge, skills, or virtues), as well as the positive change in their attitude about the process and the outcome (Michels, 2011; Roberts, 2004). Nevertheless, the direct links between the ideal of deliberative democracy and real-life science-policy practice are yet to be established.

Some other ideals encompassed in deliberation have also been challenged and faced with dilemmas between ideal and practice (Bächtiger et al., 2018). For example, the ideal of consensus, which stresses the importance of consensus as the goal of deliberation, has shifted to allow the existence of fair compromises or bargains in practice. This ideal is also inconsistent with the social constructivist research tradition in STS, which entails a critique of universal solutions, and it poses another challenge for real-life practice, where the discursive process must be closed down at some point. Besides, the ideal of publicity (or transparency) has been criticised as unsuitable for every deliberation, especially when it comes to strategic situations. However, too much attention to this uneasiness could lead to a relapse into closed decision-making by scientific experts, which erodes the concept of expert democratisation. Therefore, while the legitimacy of the theory has to rely heavily on its normative arguments, too much dependence on them could make it hard to be legitimate in a practical sense.

Considering that democracy articulates the relations between state and civil society regarding making decisions under increasing uncertainty in the modern world, it would also be worth exploring this relationship through the notion of responsibility for the justification of the theory. Pellizzoni (2004)

classifies types of state responsibility by building a two-dimensional space: the distinction between 'in-order-to-motives (pull factors)' and 'because-motives (push factors)', and between future and past. If its attribution of responsibility is anticipatory and refers to the push factor, the type could be called *care*. Likewise, he named the other three types of responsibility: *liability*, which pertains to past events and refers to the push factor; *accountability*, which concerns past events and mentions the pull factor; and *responsiveness*, which is relevant to future events and connected with the pull factor. While the term responsibility is used today as an 'ambiguous or multi-layered term' (Giddens, 1999), Pellizzoni tried to establish a typology in a political sense from the perspectives of imputability and answerability.

Through the analysis of the European governance of the environment, Pellizzoni notes that there has been a transition in the form of state responsibility in modern society, although each type still co-exists in today's recognition of responsibility. In the beginning, the state's responsibility to its fellow citizens was similar to that of a mother to her children, whom she knows very well (i.e., *care* type). However, early environmental problems in the 1950s-1960s unearthed the malfunction of existing regulations, urging them to be technically fixed and strengthened (action led by *liability*). Yet, with growing social complexity relevant to technical expertise, governments' traditional political answerability as an authority reached its limits, which promoted openness in policy decision-making with an increase in the need for justification of choices and actions (the emergence of the notion of *accountability*). According to Pellizzoni, these shifts have coincided with efforts to recover the decline in the social perception of institutional authoritativeness and trustworthiness, although they have not fulfilled the object.

The growing call for deliberative democracy could allow us to consider the fourth dimension: *responsiveness*. Pellizzoni explains that responsiveness refers to a situation 'where there is neither presumption of sufficient

knowledge and control nor reliance on ex-post accounts and adjustment of self-established courses of action, but rather a receptive attitude to external inputs to help in deciding what to do' (Pellizzoni, 2004). More specifically, he articulates responsiveness by criticising current approaches taken by European environmental policies as *unresponsive*; he attributes the failure of the previous shifts in the form of responsibility in recovering institutional legitimacy to their 'reactive, self-referential, close-ended logic of rejection or assimilation embedded in the tradition of the modern state and the economic and scientific enterprise', which responsiveness tries to avoid. While referring to questions about current experiments and noting that no one can prove its necessity, Pellizzoni argued that 'an orientation to openness, listening and inclusion can be considered at least a good requisite for addressing uncertain and controversial issues […], while the drawbacks of unresponsive, reactive approaches are manifest'.

Considering the collection of indirect suggestions from several studies, we may infer the mutual entanglement between legitimacy, responsibility, and how citizens are situated in each society. For example, Abels argues that the principal functions of participatory technology assessment, which engage the public as well as scientific experts in technology assessment, are (typically input) legitimacy and accountability (Abels, 2007). When articulating the conception of green political theory, Goodin naturally mentions that '[t]o advocate democracy is to advocate procedures' (Goodin, 1992). These insights indicate that the key to legitimating a decision in Western democratic policy embraces accountability-type of responsibility, which Pellizzoni identifies as a core principle of an 'audit society' (Pellizzoni, 2004). In addition, policymaking inherently entails its target, that is, citizens and society (Schneider & Ingram, 1997). Given these findings, it is reasonable to assume that the type of legitimacy correlates with one of responsibility and also its target–citizens in a given society. If so, these mutual relationships could be worth investigating with serious attention.

So far, we have seen two different lineages of scholarship that commonly criticise the technocratic knowledge claims in science policy-making for dismissing or expelling public insights. It should be noted that while these arguments are rooted in different logics, they similarly focus on the input stage in policy decision-making processes, which resonates with the normative fundamentals that Western democracy embraces (Bekkers & Edwards, 2007).

Two Approaches: Direct Conveyance of Public Voice or Intervening Science Advice

On the basis of these two lines of literature described above, recent studies focusing on the democratic governance of science have analysed mainly two approaches, specifically, the 'public dialogue' (Goodin & Dryzek, 2006; Macnaghten & Chilvers, 2014; Pieczka & Escobar, 2013) and 'lay participation in scientific advisory committees (SACs)' (Brown, 2008; Jones & Irwin, 2010; Stilgoe et al., 2006). This subsection will describe these measures, reviewing the processes of knowledge production and its incorporation into decision-making.

While both intend to convey public opinions or knowledge into the arena of national policymaking, there are several differences between these approaches. Public dialogue is designed to develop or elucidate public opinion through deliberative processes within small groups, or 'mini-publics' in Goodin and Dryzek's words (Goodin & Dryzek, 2006). In this regard, participatory approaches such as Sciencewise in the UK, participatory technology assessment (pTA) or consensus conference could roughly be included in this category (Abels, 2007; Davies & Horst, 2015; Macnaghten & Chilvers, 2014). Although these workshops involve scientists or relevant specialists (Sciencewise, 2016), they mainly focus on shaping public opinion toward novel technologies. Accordingly, the spaces for constructing scientific advice and public opinion are physically separated, and the ultimate judgement incorporating both is likely to be left in the hands of policymaking

organisations, which is somewhat less visible to the publics. Therefore, when the final policy outcomes scarcely reflect public opinions–in other words, when they seem to lack output legitimacy, criticisms are apt to centre around this invisible 'backstage' of the policymaking process (Hilgartner, 2000). Some have tried to propose novel concepts to understand the mechanism(s) behind the scenes, such as technocratic views that devalue public opinion or the embedded 'regime of technoscientific normativity' (Bora, 2010; Kurath, 2009; Smallman, 2020). I will describe these criticisms in more detail later.

Contrary to public dialogue, lay participation in SACs could be a somewhat more deliberative approach, in terms that it directly entangles lay perspectives with scientific advice to policymakers in the open deliberation arena of advisory committees (Brown, 2008). In comparison to public dialogue, in which the space for developing public opinion is separated from the ones for scientific advice and following final consideration, this approach enables the publics to explicitly participate in establishing advice for policymakers. While it is difficult to categorically determine which method is the best for public engagement in policymaking (Rowe & Frewer, 2000), open discussion in SACs can at least partly expose the process of comparison between scientific expertise and public knowledge for final consideration in decision-making, which was operated at the hidden 'backstage' in policymaking institutions.

In both academic and political realms, it is widely accepted that laypeople in SACs can 'play a valuable role' (Jones & Irwin, 2010; Phillips et al., 2000). According to Fiorino (1990), there are mainly three positive impacts of lay membership: substantive one that their judgments about risk are as sound as or more so than those of experts; normative one that technocracy is not compatible with democratic ideals; and instrumental one that lay participation in risk decisions makes the process more legitimate and leads to a smooth implementation of decisions. Later, Jones and Irwin (2010) gave a more concrete explanation for the merit of lay membership, raising two

leading roles of lay members through empirical analysis. Firstly, they represent the publics and public interest and facilitate SACs by improving transparency and integrity, bridging expert and non-expert, and providing 'social reference'. Secondly, lay members do integrate themselves into the practice of generating advice as complementary experts and performing challenging roles. However, as far as we know, STS studies on lay memberships or the diversity in scientific advisory committees are relatively limited compared to that on public dialogue, possibly because the operation of these committees is administered by governmental bodies or relevant public organisations, which makes it less approachable for academic investigation or intervention.

While various merits of the deliberative approach have been argued, we should also recognise that this practice in the governance of science and technology also has several technical challenges. Firstly, the choice of membership is critical for this approach to maintain the quality of deliberation (Burgess et al., 2007). In general, deliberation processes take a long time, and the number of memberships tends to be limited (Roberts, 2004). Thus, the balance in membership and their capacity are crucial factors. Besides, concerning lay membership in SACs, the power balance inside the committees must be considered carefully (Irwin, 2001). In some deliberation, experts or even chairpersons regard lay members as welcome only when they do not touch the business of experts (Stilgoe et al., 2006), and there is a risk that lay members are paid less attention during the deliberation processes. Secondly, the influence of administrators who run the committees, including drafting the reports or relevant documents, cannot be entirely excluded, although they are basically required to be secretaries rather than decision-makers (Hilgartner, 2000; Irwin, 2001; Stilgoe et al., 2006). I will discuss this issue in more detail in the following subsection.

The Challenge of PEST

Despite these persistent efforts, science policy-making is still far from fully democratised (see, for instance, Goodin & Dryzek, 2006; Hansen & Allansdottir, 2011). In addition to the structural challenges described above, myriads of studies have tried to articulate the institutional reasons behind this stagnation. In the STS field, they have come mainly from two different perspectives, as shown below.

The first viewpoint focuses on *the very policy decision-making phase after knowledge incorporation*; criticisms and arguments from recent STS scholarship have centred around policymaking institutions, concerning that policymakers rarely reflect public opinion in the final outputs of policymaking. Hamlett (2003) argued that governmental bodies tend to superficially introduce public engagement just for the domestication of the lay public. Dryzek and his colleagues (2009) pointed to the 'Promethean' outlook among governing elites that prevents them from being compatible with 'precautionary' reflexive publics.

The other is targeting *the division between science and society*. One representative is the criticism against 'scientism'. Welsh and Wynne (2013) condemn scientists and policy elites for using 'science as a source of authority in ways which extend beyond scientific and technical domains, such as those involved in risk assessments, to include wider social and normative commitments'. The scientistic attitude that grants implicit authority to scientific knowledge claims could limit the input from other lineages of knowledge production in society. Similarly, some critiques pointed out that policymakers pay less attention to social knowledge due to the traditional technocratic division of experts and laypeople (see, for instance, Kurath, 2009; Wilsdon & Willis, 2004). More in detail, Bora (2010) suggested that a shared alliance between science and policy sides negatively influences the impact of participatory or deliberative practices by prioritising scientific expertise and excluding political discourse.

2.3. Gaps in the Previous Research?

Then, will the articulation in previous research be a key to overcoming the current struggle in PEST straightforwardly? I would like to point out several problems behind the articulations.

The Gap in Recent Research: Ignored or Over-simplified Actors in Policy Drama

As mentioned above, many, if not most, criticisms of *the very policy decision-making phase after knowledge incorporation* argue that policymakers rarely reflect public opinion in the final outputs of policymaking. However, these critics might pay little attention to the active and unique role of administrative staff in policymaking processes. Indeed, few studies have paid attention to civil servants or other public officials, with few exceptions (Smallman, 2018, 2020). Civil servants are often confused with elected politicians, indiscriminately treated as the 'policy elite' (Jasanoff, 2005b), or sometimes even grouped with scientists as if they scrum to be an oppositional monolith against the publics (Welsh & Wynne, 2013).

However, I argue that we must admit, whether we like it or not, the unavoidable and distinctive commitments of such administrative staff in science policy-making (Hilgartner, 2000; Irwin, 2001; Smallman, 2018; Stilgoe et al., 2006). In hindsight, the scientific advisors were introduced to counterbalance the dominating power of the bureaucracy (Brooks, 1964), which, on reflection, implicitly recognised the necessary commitment of public officials to science policy. In addition, many issues related to science policy do not always involve elected policymakers and stay within the jurisdiction of civil servants (Biegelbauer & Hansen, 2011). In particular, some countries, such as the United Kingdom or Japan, accept substantial commitments of civil servants to policymaking processes (Mishima, 2017; Page, 2003; Page, 2013; Tsuneki, 2012).

The most important thing to be pointed out could be that the assumption shared among these previous critics has a risk of making the stagnation in the democratisation of science and technology even worse. Akkerman and her colleagues (2004) argued that the shared concept of the simple bipolar model of state-civil society relationships, which was to protect against the potentially tyrannical state powers, can lead to mistrust of an active role for the state and hinder corporatist approaches in the engagement with scientific governance. Indeed, especially in SAC and other deliberation processes, public officials often play the role of secretariats, or 'stagehands' (Hilgartner, 2000), with whom the actors on the stage need to keep close communication. Thus, we should keep a more inclusive perspective that acknowledges the civil servants' role in policymaking rather than shutting them out from the scope.

We should also alert the criticism of *the division between science and society* to the role of civil servants. Arguments for public participation call for paying equal attention to different knowledges (Cohen, 1997; Fischer, 2009; Hamlett, 2003). However, they tend to stress positioning public knowledges at the same rank as scientific knowledge but do not try to reconsider the bureaucratic channel previously bypassed by technocratic policymaking (Brooks, 1964). In this regard, we may think that technocratic knowledge incorporation, in which scientific knowledge overtakes bureaucracy, is problematic not only because it neglects the public knowledges but also because it disregards knowledge production within bureaucracy. Indeed, Sturgis and Allum (2004) argued that the level of political knowledge could affect opinions on scientific issues. Here, I do not intend to introduce another deficit model into the science-policy arena. Nevertheless, if we adopt deliberative democracy theory and insist on equal attention to diverse expertises or opinions in science policy, it is not fair to exclude particular actors from consequent inclusive deliberations.

Compared to those in STS, scholars in political science have paid more attention to public officials in their scholarly works. Still, most previous studies have provided rather over-simplified descriptions of the role of civil servants in policymaking, and their conclusions seem inconsistent with each other. Proponents of the Public Choice Theory regarded civil servants as highly self-interested, arrogant people who only benefit themselves, ignoring the publics (Ostrom & Ostrom, 1971). However, this stereotypical assumption has been challenged by several experiments and observations, which elucidated their ethical behaviour as a servant of society (Zamir & Sulitzeanu-Kenan, 2018). Also, others concerning political influences have claimed that civil servants in the UK are under democratic control because they normatively act based on the anticipated preference of elected ministers (politicians), which supposedly reflects the will of the publics (Bevan, 2015; E. Page, 2012). From another viewpoint, some researchers have argued that the works of government officials are legally regulated through procedural control (Mccubbins et al., 1987). This seemingly chaotic accumulation of studies indicates that the behaviours of public officials are not always compatible with such systematic assumptions, nevertheless suggesting that civil servants are active players in policymaking processes whose behaviours are influenced by external factors rather than internal motivation.

These lines of studies provide sufficient grounds for proposing a new approach to understanding the role of public officials — a relatively disregarded actor who is nevertheless interwoven with deliberative policymaking processes — focusing on the interaction between public officials and other actors.

The Difference in Political Culture Among Countries

It is not novel to argue for considering local conditions in comparison among countries or applying theories or practices across cultures. Research in political science has suggested that the impact of deliberative technique is influenced by differences in ideal democratic models among countries

(Biegelbauer & Hansen, 2011). These reports suggest that even recent theoretical arguments in science policy cannot be easily transferred from one nation to another.

More in-depth, STS theorists have argued that political cultures are different among countries and that these differences can influence policy outcomes. For example, in her study of the 'civic epistemology of modern nation states', Jasanoff (2005c) cautioned that previous cross-national research on the politics in science and technology, which aimed to harmonise regulation among countries, had assumed that 'technically complex decision making takes its color more from the nature of the issues than from features of national culture or politics'. According to her study of Western countries (the US, UK and Germany), regulatory systems, for example, could illustrate national characteristics. In particular, the interpretation of scientific evidence is conditioned by local traditions of legal and political reasoning, as well as habits of deference or scepticism toward expert authority, because there are 'different routes of reasoning and public justification' among societies. Her concept of 'civic epistemology' refers to such 'institutionalized practices by which members of a given society test and deploy knowledge claims used as a basis for making collective choices'. She argued that there had been little consideration of the cultural or political backgrounds in such practice. These considerations are rooted in the criticism of scientific universalism and technological determinism (Jasanoff, 2005c). Using the word 'legitimacy' (or 'legitimate') to explain her argument, we could say that cultural differences could influence how a given knowledge claim is regarded as legitimate when considering what is to be incorporated for policymaking.

Still, going back to the typology of democratic legitimacy and responsibility, I argue that even the concept of civic epistemology has not yet given thorough consideration to cultural differences. In her argument, Jasanoff is concerned about what sorts of knowledge claims are eligible to be tabled in collective decision-making and criticises scientistic justification,

which means *her analysis centres around the input phase of policymaking*, in line with other studies in democratic governance in science (see such as Biegelbauer & Hansen, 2011; Durant, 1999; Hamlett, 2003). Here, I would point out that these arguments unconsciously prioritise input-oriented legitimacy, which secures 'procedural justice' (Delli Carpini et al., 2004) and has been central to Western liberal democracy's development (Bekkers & Edwards, 2007). However, they might fail to recognise that legitimate input does not always assure socially legitimate policy outcomes in other cultures. Bluntly speaking, this could have a risk of another universalism regarding democratic society, missing differences in situated conceptions of social legitimacy.

In this regard, several works in political science could champion my concerns above. For example, by proposing the idea of the 'capitalist developmental state[7]', Johnson argued that Japanese democracy is not a late-blooming version of its Western counterpart (Johnson, 1999). True, the government bureaucracy held supreme authority over society in Japan (Sugimoto, 2020), which is quite unlike Western democracy (Lebo, 2013; Pempel, 1974). In Japan, policymaking, including the preparation of new legislation, lies largely in the hands of civil servants, and even debates on the Diet are almost symbolic exercises whose conclusions are also predetermined by the bureaucracy (Jong et al., 1995; Mishima, 2017). However, it should be emphasised that this system is neither typical of authoritarian regimes nor fascist ideology. Johnson explained that the Japanese bureaucracy's legitimation 'occurs from the state's achievements, not from the way it came to power'. His study showed that the 'elite state bureaucracy staffed by the best managerial talent available in the system' functioned effectively in rebuilding the country's economy in the early post-war period. Through the analysis of this economic revitalisation called the 'Japanese Miracle', he led

[7] It is important to distinguish the term 'developmental state' from 'developing country', which may sound similar. The former highlights a political attitude of pursuing industrial growth, while the latter typically refers to a nation with a relatively lower economic standard.

the contention that while elected politicians in this country reign, the bureaucracy has substantial power to rule society, 'enjoy[ing] legitimacy in the sense that their claim to political power is based on some source of authority above and beyond themselves'. In addition, successive works have revealed that this model of bureaucracy is not unique to Japan but is widely shared among East Asian industrial countries, such as China or South Korea (Karo, 2018; Kim, 2017).

Johnson's study and the typology of democratic legitimacy let us speculate that the legitimacy of the bureaucracy's commitment in developmental states does not come from procedures but their aims, which can only be evaluated afterwards–whether their interference has successfully led to results preferable for the people. In other words, the conception of democratic legitimacy in Japan may place more emphasis on the output type. This could highlight a contrast with the premise in Jasanoff's analysis, which concerns how scientific expertise is incorporated as legitimate input into collective decision-making (Jasanoff, 2005a). To reiterate Jasanoff's definition of civic epistemology: 'institutionalized practices by which members of a given society test and deploy knowledge claims used as a basis for making collective choices'. This conception implicitly develops on the basis of Western democratic premises, assuming legitimacy is located in the input phase before decision-making. The emphasis on output legitimacy, which focuses on the legitimacy of decisions made through policymaking practice, could make it fundamentally different how people treat scientific knowledge in policymaking exercises, so we might want to employ different analytic lenses that can carefully consider the differences regarding social legitimacy in decision-making in each community.

The little attention to the active and unique roles of civil servants in policymaking, as reviewed in the preceding subsection, could also resonate with a biased conception of democratic legitimacy in policy decision-making. Civil servants typically engage in policymaking after the incorporation of

knowledge, often working 'behind the scenes' (Hilgartner, 2000). In this phase of policymaking, the *raw* materials for policy are usually out of the hands of the publics; thus, the phase is apart from the input phase of policymaking. Therefore, if one disregards phases in policymaking other than the input phase, one could fail to fully acknowledge the influence of civil servants in policymaking, and vice versa.

In addition to the political scheme and its surrounding conceptions, Japanese behavioural features in the policy arena could also be an important factor to consider. A previous study that focused on the trial of consensus conferences (Nishizawa, 2005) pointed out that characteristic behavioural features reflecting the Japanese style of conflict management had negatively affected the impact of public engagement in the country. In this article, the author indicated that ethical norms shared among Japanese people, such as deferential values and conformist attitudes, fostered the prioritisation of scientists' and experts' views in the deliberation scheme.

In light of these differences in political culture, we might also give a critical argument against the previous explanations of the struggle in PEST, including scientism. These studies have tended to either condemn practices such as the dismissal of non-scientific concerns in collective decision-making, highlighting the contrast with the prioritisation of science (Bora, 2010; Kurath, 2009; Welsh & Wynne, 2013) or point out the bureaucratic intervention and bias against insights from the publics after the input phase as if it is democratically illegitimate (Hamlett, 2003), regardless of the country in question. I do not intend to deny or refuse these arguments, but I would propose that if we pay attention to the difference in the concept of democratic legitimacy in decision-making, the articulations and criticisms could achieve higher resolution, which could potentially fit better in each society.

The Re-review of the Position of Civil Servants

Readers might remember that I previously mentioned that the Japanese political culture of high commitment of civil servants with autonomy has much in common with the UK, a country of Western democracy (Page, 2003; Richards & Smith, 2000, 2016). Let me review the studies on civil servants in both countries again, considering the notion of democratic legitimacy.

In the UK, the Whitehall administrative tradition has been shaken since Margaret Thatcher introduced consequential reforms to the UK's political institution to control the bureaucracy in the 1970s (Grube, 2017; Richards & Smith, 2016). This tradition was characterised by the invisibility and autonomy of civil servants, who were expected to advise their ministers regarding their responsible policy fields monopolistically. Under these circumstances, what governs civil servants was somewhat normative and unwritten factors, such as an ethos of impartiality, meritocracy, and agreement of ministers. The series of reforms attempted to change these traditional behaviours of civil servants, seeking to restore democratic accountability to the public.

The counteraction against the tradition employed procedures as equipment for controlling civil servants. One example is the introduction of Executive Agencies, which aimed to separate operational issues from departments and then induce the 'depoliticisation' of such matters (Hogwood et al., 2001). The chief executive is supposed to have operational autonomy through the Framework Document with a five-year review cycle, which outlines managerial devolution to the chief executive, and an annual plan with the report. Another example could be the Osmotherly rule, introduced in 1971, which demanded the 'democratic accountability' of civil servants (Grube, 2017; Guerin et al., 2018). These regulatory reforms insisted on the democratic legitimacy of upstream control of civil servants, and officials could not afford to ignore them openly. This approach has in common with the

legitimation of decision-making in Western democracy, which emphasises the phase before actions. Also, it is noteworthy that while obeying the rule, the bureaucrats sought to preserve their tradition. In other words, there has been a conflict between democratically legitimate procedural rules which require civil servants to obey on the stage on the one hand and bureaucracy's resistance or deviation behind the scenes on the other, which could resonate with the sense of 'procedural justice' (Delli Carpini et al., 2004).

On the other hand, Japan does not basically refuse civil servants' autonomy because it has a certain legitimacy. Although there are several schemes to control bureaucracy, they are more symbolic and informal. One particular example is 'Somu-kai (General Affairs Committee)', held by the ruling Liberal Democratic Party (LDP). No Cabinet's legislative proposal, actually provided by civil servants, can be discussed in the Diet unless it gets unanimous approval in Somu-kai (Estévez-Abe, 2006). Importantly, there is no legal or even written party rule mandating such a process, and this kind of lack of official rules is a common means in administrative culture in this country (Rohlen, 1989). In other words, political control of Japanese civil servants is more ritual-like[8], which could be retained without written procedures. These customs, which coerce civil servants to respect the elected politicians, proactively developing policies and bills that would meet the preference of the leading party (and the electorates as well), could resonate with the nation's emphasis on output legitimacy; that is, policy for the people.

While the UK admit civil servants' hidden autonomy behind the scenes against legitimate democratic regulations aimed at limiting their freedom, Japan requires bureaucracy to respect democratically elected politicians despite the absence of clear rules, presupposing the civil servants' power of decision-making on their own. These scenarios may appear identical in terms

[8] The idea of Japanese policy culture as 'ritualistic' also comes from the discussion with Mikihito Tanaka, a participant in the Comparative Covid Response Project from Japan.

of the autonomy granted to civil servants, but the cultural contexts surrounding them are somewhat different.

2.4. Chapter Postscript

In this chapter, I have tracked the history of science policy since the mid-20th century: the development of scientific advice, which had met its limitations, and the introduction of PEST.

I also reviewed the recent challenges in PEST, referring to the analyses of the underlying reasons. In particular, by employing the political science literature on legitimacy and responsibility, I drew a possible perspective that previous STS literature has overlooked, taking it for granted. Earlier studies developed on the basis of the Western democratic premise that assumes legitimacy lies in the input phase of decision-making, so existing analytic lenses are not fully appropriate to articulate how the publics are situated in a society embracing different types of legitimacy and responsibility. Even civic epistemology begins with how knowledge claims can be incorporated as legitimate inputs for collective decision-making, which represents just one form of the entanglement of knowledge claims with the legitimacy of decision-making. It could be one that still has some space for further investigation while acknowledging several studies on public engagement that pay attention to developmental states (Saito, 2021).

In addition, as far as the chapter has reviewed, the unique involvement of civil servants (especially in societies where they have a considerable commitment to policymaking) is another factor that previous studies have missed paying careful attention to. Their considerable commitment in several countries is worth closer examination. Again, they are also tightly entangled with the conception of legitimacy as well as responsibility.

Now, I have developed what this thesis should dig into. The next chapter will develop an analytical approach and customised equipment for anatomising the policy discourse.

Chapter 3: Research Questions and Methodology

In this chapter, I will determine the scope of the research and research questions, as well as how to approach them. First, I will confirm the ontological and epistemological standpoints of the study and then describe the hypothetical claim led by the literature review. Before setting working research questions based on the hypothesis, I will introduce the analytical lens for the study, which is tightly connected to the research questions.

I have already clarified that the aim of this thesis is to articulate how the publics are situated in the science policy arena in the context of PEST, with the intention of proposing possible approaches for overcoming its challenges. Meanwhile, in the literature review chapter, I have also drawn that the analytic frames in the previous studies are not fully adequate for articulating the typology of legitimacy and responsibility in a given society, on which I would like to focus and compare across political cultures. Therefore, this chapter aims to develop a more comprehensive analytical lens, in which the conception of legitimacy and responsibility are taken into consideration as parameters, and that can place how the publics are treated in the policymaking practice at the centre of the analytical focus as the manifestation of these parameters. In this regard, I would employ the social imaginary as the principal analytical framework to elucidate these parameters.

Then, I will provide an explanation of how to approach the questions. I will adopt a comparative qualitative case study between the policy discourse on similar biomedical technology in the UK and Japan. Both cases could be technically similar and thus preferable for elucidating the cultural factors that influence the visible contrasts between them.

3.1. Hypothetical Claim for Research Questions

Any research should be designed based on both ontological consideration and epistemological consideration of research questions, which is vital for a researcher to decide whether to choose a qualitative or quantitative research strategy. Moreover, this step is also important for building the research questions of the thesis.

First, we must care about the questions of ontology. One position, namely objectivism, argues that social phenomena around us are external facts independent of our reach or any social influence. That is, our knowledge about the world is developed from objective reality. On the other hand, constructionism takes the position that organisational and cultural conditions are pre-given and, therefore, social phenomena and their meanings are continually being accomplished by social actors.

Regarding epistemology, there are two main types of doctrine: namely, positivism and interpretivism. Bryman (2016) provides the five principles of positivism:

1. Only phenomena and, hence, knowledge confirmed by the senses can genuinely be warranted as knowledge (*the principle of phenomenalism*)
2. The purpose of theory is to generate hypotheses that can be tested and that will thereby allow explanations of laws to be assessed (*the principle of deductivism*)
3. Knowledge is arrived at through the gathering of facts that provide the basis for laws (*the principle of inductivism*)
4. Science must (and presumably can) be conducted in a way that is value-free (that is, *objective*)
5. There is a clear distinction between scientific statements and normative statements and a belief that the former is the true domain of the scientist. This last principle is implied by the first because the truth or otherwise of normative statements cannot be confirmed by the senses.

Many natural science research projects adopt positivist approaches. Also, positivists tend to argue that the causal relationship revealed through the study can allow people to predict future phenomena.

Interpretivism, on the other hand, is a term for an epistemology that is opposite to what positivists propose. It involves a view that the subjects–in social science, people or society–and contexts are tightly tangled, and so are facts and values. Moreover, it even argues that an investigator cannot be independent of the research subjects. Therefore, they cannot be explained objectively or neutrally in a positivist way. This position is based on constructivist ontology.

However, there is another epistemological doctrine that seems to combine the former two: critical realism. Critical realists and positivists share the recognition of the independent existence of the reality of the natural world; therefore, ontologically, they belong to the objectivist doctrine. On the other hand, unlike positivists, critical realists acknowledge that there are various ways of conceptualising reality; that is, positivist conceptualisation is just one way of understanding that reality. They underscore the importance of the structures or contexts behind the phenomena and recognise that these structures are not apparent in an observable way. It is important to note that critical realism adopts retroductive reasoning (also called abductive reasoning), which involves making an inference about the causal mechanism lying behind and being responsible for regularities observed in the social world.

This study adopts this retroductive reasoning for inference, and it examines the likelihood of hypothetical claims through observations of the real world. As mentioned in the preceding chapter, this study will pay special attention to the conception of (democratic) legitimacy in the science policy system of a given society. *How to evaluate policy decisions' legitimacy*, which thus may be more technical or procedural, can be transferable across cultures,

although adjustments are needed for individual cases. On the other hand, studies on sociotechnical imaginaries and developmental states could suggest that *how policy decisions obtain legitimacy*–that is, how people recognise evidence for the decision-making or even the very policy decision-making process and result as democratically legitimate–cannot be universal. This study will particularly emphasise the latter and investigate its influence on PEST. If the assumed way of democratic legitimisation in policy-making decisions varies across societies, there could be a more detailed, if not entirely different, explanation for the dismissal of public insights and prioritisation of scientific knowledge claims, which is raised as the hypothetical claim in this study:

> *<Hypothesis>*
> *How people recognise policy decisions as legitimate, which could be different across cultures, has a crucial influence on how the publics are situated in the actual science-policy processes (i.e., how the publics are kept away from the core commitment to science-policy decision-making)*

However, I need to be aware of the difficulty in straightforwardly verifying the hypothesis above. In particular, people seldom state clearly how the publics are situated. Also, given that the study pays special attention to the involvement of civil servants, I also need to consider the difficulty of investigating how these people think or assume things (Baker, 2013). Moreover, there appears to be a logical gap between the socially shared conception of democratic legitimacy in policy decision-making and the current struggle in PEST, which could require some concept bridging these issues. In the next subsection, I will outline how to approach the problems.

3.2. Analytical Lens: Social Imaginaries

To tackle the aforementioned challenge, I adopt the concept of imaginaries (Taylor, 2002) as the analytical lens to elucidate clues for

examining the hypothesis. Some might think it is taking a detour because it does not directly assess the procedures or impacts of public engagement exercises themselves. However, works across different disciplines have recognised the importance of imaginaries, which laid the groundwork for understanding the mechanism of the establishment of moral orders or collective practices or relationships among actors, which organise our social life. Here, I provide some theoretical grounds for using imaginaries for the analytical framework.

Imaginaries and Social Orders

Contrary to its etymology, socio-political theorists argue that the imaginary is not merely a hope or fantasy in human minds but rather a strong driving force of collective behaviours that shape our social life. For example, Canadian philosopher Charles Taylor emphasised this aspect by introducing the term 'the social imaginary' (Taylor, 2002). According to Taylor, the social imaginary refers to a 'common understanding that makes possible common practices and a widely shared sense of legitimacy' (Taylor, 2004). Also, he mentioned that social imaginaries are more than just norms underlying our social life; certain imaginaries can make such norms realisable as a form of social practice. Therefore, we could understand how collective actions in a given society have been performed and how they are regarded as legitimate in that society through the investigation of the imaginary behind them.

STS is no exception to this movement, and since the early 21st century, an increasing number of STS studies have plunged into analysing imaginaries embedded in social practices relevant to science and technology (McNeil, Arribas-Ayllon, Haran, Mackenzie, & Tutton, 2017). Notably, Jasanoff and Kim have explored the imaginaries more distinctly entangled with science and technology policy. Their coinage, 'the sociotechnical imaginaries', denotes 'collectively imagined forms of social life and social order reflected in the design and fulfilment of nation-specific scientific and/or technological projects' (Jasanoff & Kim, 2009). They also argue that

sociotechnical imaginaries prescribe active exercises of state power or large organisations, such as policymaking, which exert considerable impacts on society.

Later, many researchers followed this course and articulated different sociotechnical imaginaries surrounding science policy-making practice and how they made impacts on the actual policy outputs (Ballo, 2015; Molden & Meehan, 2018; Smallman, 2018). Mikami (2015) applied this concept to his investigation of regenerative medicine research projects in Japan. He introduced the notion of 'imaginary lock-in' and argued that the early material commitment to iPS (induced pluripotent stem) cells by the national government became a determinative driving force while discrediting other alternative visions (i.e., oocytes or ES cells). Similarly, Yamaguchi (2014) described that the Japanese expectation of the 'zero risk principle' in food safety, established before the BSE crisis, has made it difficult for the government to take a new stance based on the acknowledgement of the existence of risks and uncertainties.

It is worth noting that imaginaries are not universal but rather reflect the cultural, historical, and political atmosphere of communities; thus, in the science-policy context, these imaginaries differ among countries. Indeed, Jasanoff and Kim, pioneers in sociotechnical imaginaries analysis, strongly argued such differences by contrasting the trajectories of nuclear policies in the USA and South Korea (Jasanoff & Kim, 2009). This notion is consistent with the other studies in science policy I previously described, highlighting the significance of national political, social, and cultural background.

Moreover, even within the same country, different groups or strata of the population can possess different imaginaries. In her study comparing the discourses emerging from public debates and those in analogous expert scientific and policy reports, Smallman (2018) identified two different sociotechnical imaginaries in the UK science-policy arena: one held by elites

(i.e., scientists and policymakers), and the other by the public. She explained that the difference between two imaginaries–specifically, 'science to the rescue' and 'contingent progress'–could contribute to the limited influence of public dialogue upon the policy outputs.

Imaginaries of Actors Entangled in Science Policy

While different social groups have their specific imaginaries of societies or objects, people can also develop specific imaginaries of particular groups of people, including the publics. For example, Lezaun and Soneryd (2007) noted that in *GM nation* workshops in the UK, consultants who organised the exercises tried to choose participants to construct 'ordinary citizens' based on the candidates' experience with GM issues. On the other hand, Cook and colleagues (2004) led a conclusion from the interview with the scientists who joined GM public debates in the country that the publics were recognised as emotional rather than rational, and also vulnerable to manipulation by self-interested advocates.

These imaginaries could also have an impact on the actual treatment of people. De Saille (2015) suggested a further category between the political imaginary of invited and uninvited publics in the paradox of public engagement activities. The notion of an 'unruly public', she argued, operates within sociotechnical imaginaries possessed by the governments, providing states with a rationale to disinvite those who are committed to technological protest movements and respond in a way that is unwanted and unpredictable for the states. Rip (2006) described another problem caused by the imaginaries of the publics. The pro-nanotech scientists and technologists were too afraid of the possible public concerns against their aspirations, let alone resistance. This fear, or in Rip's words, 'nanophobia-phobia', emerged from the pro-nanotech's homogenous view of the publics based on the deficit model and led to the overreaction of nanotech actors toward the imagined public concerns, even if they were, in fact, absent. He also mentioned that this

kind of imaginary is not limited to nanotechnology but could also be seen in various fields of science, such as chemistry (see also Marris, 2015).

These technopolitical imaginaries of the publics are different from sociotechnical imaginaries, which are at the same time the result of and instruments of the very co-production of science and social order. Nor do these imaginaries share some crucial aspects of sociotechnical imaginaries, such as futuristic property or the implication to the evolutional course of science and technology or states (Jasanoff & Kim, 2009). On the other hand, studies of the imaginary of the publics above suggest they could have some features in common with sociotechnical imaginaries: both are performative, instrumental, and associated with the active exercise of state power. Therefore, these imaginaries also have the potential to contribute to the co-production of science, technology and social order in association with sociotechnical imaginaries.

It could also be of note to review why such imaginaries obtain performative effects. When political scientist Page introduced 'imaginary ministers' possessed by civil servants (Page, 2012), he pointed out that since it is somewhat unrealistic for civil servants to ask the 'real' ministers for instruction in every decision-making process, they construct these 'imagined' ministers with whom civil servants work during everyday decision making, based on ministers' previous speeches, comments, or hearsay. Thus, his study suggests that limited opportunities for direct communication with their counterparts lead civil servants to construct an imaginary of them. Likewise, a recent concept in media studies, namely 'imagined audience', provides a similar explanation (Litt, 2012). While regular communication with an actual audience is based on face-to-face communication, today's communication through media makes it difficult for the actual audience to be visible or known. In other words, individuals who disseminate information become more reliant on their imagination, which has a substantial influence on the behaviours they display to the actual audience (Webster, 1998). If so, actual science

policy-making, especially when it is hard to directly communicate with every citizen, has to rely on the imaginary of the publics in considering how the policy could influence and be influenced by the real publics.

Imaginaries as an Analytic Lens

The previous studies can provide a theoretical foundation for arguing that the imaginaries of the publics, or simply 'Imagined Publics', could be an advantageous analytical lens for elucidating a missing link between how policy decision-making obtains legitimacy and how the publics are treated in the real science policy arena.

First, as mentioned in the preceding subsection, we could assume that the Imagined Publics could have an influence on how they are treated in actual policy practices, especially in terms of public engagement. For example, Reynolds (2013) argued that the imaginary of the 'ordinary public (in Lezaun and Soneryd's words, 2007)' constructed by consultants in GM Nation was different from the one in the broader controversy over GM crops, or more precisely, the publics, which made the issue even more controversial. Similarly, Marris (2015) characterised the fear of the publics' fear of synthetic biology held by the scientific community and technocratic policymaking institutions as 'synbiophobia-phobia' and pointed out its role as the driving force behind their promotion of public engagement, which twists the activities into convincing the publics of the novel technology, instead of achieving the inclusive participation in scientific governance. Therefore, the analysis of the Imagined Publics in science policy could be a promising approach to understanding how the publics are actually treated in the science policy arena.

Second, it would be worth analysing the Imagined Publics, given that these imaginaries reflect socially shared meanings or conceptions of other actors or social orders. In this regard, Welsh and Wynne's study of 'scientism' (Welsh & Wynne, 2013) could help. They argued that the social meaning of science had shifted from its policy reference role by providing the best

available facts and information to de-facto authority to determine proper public meanings. This switch led scientific elites to regard others who question the normative commitments authorised by science as anti-science. In such conditions, the typical publics who do not have research-based scientific knowledge were imagined as 'incipient threats due to a presumed deficit in their grasp of science', and then have come to be understood as 'politicised threats to the social order requiring state control'. Their study, which exemplifies the imaginaries of the publics co-constructed with other social imaginaries of other actors (in their case, scientism), could be a good reference to propose the link between the Imagined Publics and the socially shared conception of democratic legitimacy in decision-making.

The analysis of Imagined Publics is not only useful for describing the social circumstances around science policy, but it might also suggest some alternative approaches to overcome the current struggle in PEST. While social imaginaries are firmly constructed and embedded in each society, we need to be careful not to suppose that they are static and changeless. Taylor strongly argued against this possible misinterpretation, using the modern revolution in Western societies as an example (Taylor, 2004). He explained that what had initially been just an ideal had grown into an imaginary by being taken up and mingled with conventional social practices. In this process, social practices were often transformed by contact between different clusters. Moreover, through the process of prevailing, the new or modified practices gradually changed their meaning for people and contributed to constructing a new social imaginary that people in Western and other modernised countries possess today. In other words, social imaginaries are somewhat plastic, and changes in practice or new views of moral order can change these social imaginaries through their infiltration and transformation. Rip (2006) indicated a similar point regarding the formation of 'nanophobia-phobia', claiming the significance of mutual communication and interaction between scientists and the public in solving such a problem. These arguments indicate the future possibility of transforming imaginaries in society through

communication among different social groups. I argue that this notion could hold the clue to improving the stagnation in current PEST[9]; however, as far as I could review, existing STS works have not focused much on this potential, instead limiting themselves to the articulation of various imaginaries.

Before depending too much on the Imagined Publics, I need to pay attention to the risk that the concept might not provide anything new. In this regard, I should consider that there are many types of imaginaries around the publics proposed. For example, while heavily influenced by the literature on imaginary, the concept of Imagined Publics shares a common theoretical framework with the policy design theory, especially the concept of the 'social construction of target populations (SCTP)', by which Schneider and Ingram referred to the 'characterizations or popular images of the persons or groups whose behaviour and well-being are affected by public policy' (Schneider & Ingram, 1997). A policy designer, who sets forth a policy for solving a problem, has a particular image of target groups of people whose behaviour is linked to the desired goal. In doing so, they provide benefits and burdens to different types of groups based on their relations to the policy direction; that is, the designed policy is 'delivered' to a target population (Schneider & Sidney, 2009). The SCTP serves as a political power that has a considerable impact on various policy-making processes, such as policy agenda setting, legislative behaviour, actual policy formation and design, or the groups' style of participation.

However, there are several differences to be noted. First, my analytical frame of Imagined Publics is not necessarily constructed based on the deserve-benefit logic like SCTP. This logic, which premises that the holder of a given SCTP, a policy designer, should be motivated to gain political capital for re-election, is based on the policy-making culture in the US, where elected

[9] In this connection, the concept of the Imagined Publics is also inspired by the idea from the concept of the 'Contact Hypothesis', which has long been regarded as a promising strategy in the social psychology literature (Dovidio et al., 2003).

politicians and those appointed by them play an essential role as a policy designer (Schneider & Ingram, 1993). This is not common in the UK or Japan, where non-elected civil servants serve as substantial policy designers. Second, Imagined Publics do not possess as much negative impression as SCTP does, as Schneider and Ingram argued. They argue that the SCTP results from a degenerative policy-making system, which can discourage responsible citizenship. They also argue that the diversification of targets beyond stereotypes should be determined by the rule of law, without counting on the spontaneous change in the constructions within the policy designers. In this regard, the attitude toward the Imagined Publics is more sympathetic to the contention of Dryzek and Ripley (1988), another group of policy design proponents. While admitting that policy designers incorporate their ambition into their plans, they insist that openness and communication between policy designers and the publics could improve the decisions made by policy designers.

Civic epistemology, which I mentioned in the previous chapter, also has some commonalities; the concept of epistemology takes 'as its starting point that human beings in contemporary polities are knowledgeable agents, living their lives in relation to governments, and that any democratic theory worth its salt must take note of the human capacity for knowing things in common' (Jasanoff, 2005a). This quote suggests that civic epistemology should also resonate with the Imagined Publics because they are not just prejudices of particular people toward the publics, but rather commonly shared among people in a community. However, as noted earlier, it mainly focuses on knowledge claims rather than actors; it depicts how they regard given intellectual arguments as legitimate for consideration in collective decision-making. Both civic epistemology and the Imagined Publics could be equally (at least similarly) useful when the decision-making customs after the input phase are the same among given societies.

However, since the study questions the premise and is motivated to examine decision-making practices, the analysis of the Imagined Publics could elucidate some differences that civic epistemology might fail to unveil. As previously mentioned, I must point out that civic epistemology embraces some presumptions regarding legitimacy and responsibility in policy decision-making. When aiming to articulate the very difference in legitimacy and responsibility embedded in cultures and to elucidate their entanglement with how people are situated, the Imagined Publics could be helpful in terms that they do not entail underlying premises regarding legitimacy or responsibility in policymaking.

3.3. Research Questions

Now, I have an analytical tool for examining the hypothesis mentioned at the beginning of the chapter. Let me proceed to recapture some features of the Imagined Publics based on the literature on the imaginary I reviewed in the previous subsection. If the Imagined Publics meet the requirements for the definition of imaginary, they can illustrate how the publics ought to:

- *Be situated in the science-policy arena of the society*

Or in more detail:

- *Relate and communicate with the other policy actors and*
- *Play in the making process of science policy*

Then, the analysis of the Imagined Publics should efficiently and effectively elucidate the socio-political atmosphere surrounding the publics and the relationship between science and people, which could eventually let us understand how the publics are treated in actual science policy-making practices. Considering the hypothesis above, my working research questions could be as follows:

<Research questions>

- *How are the Imagined Publics or the imaginaries of the other players constructed in each situation, and what are their features?*
- *How different are the ways of recognising democratic legitimacy under different Imagined Publics?*
- *What do the social meaning of science and sequential science policy outcomes become of, under the society with particular Imagined Publics?*

These questions need to be answered by empirical analysis of the Imagined Publics in real science-policy practices. In the next section, I will consider how to approach these questions.

3.4. Methodological Approach: A Qualitative Comparative Case Study + α

To answer the research questions above, this study adopts a qualitative comparative case study method for several reasons. First, this study is driven by the research questions derived from the hypothetical claims on the Imagined Publics in science policy and the socially shared conception of democratic legitimacy. Therefore, while these questions need *exploratory* investigations, the entire study should also be *explanatory* based on this theoretical argument. Besides, this study needs to examine real policy dialogues, which are almost impossible for a single researcher to intervene. Moreover, it pays special attention to the influence of civil servants' commitments and other cultural and social contexts surrounding the science-policy arena. This means in-depth interviews and analysis of their behaviours are necessary to understand the factors behind the imaginary shared by civil servants, while it would be hard to examine through quantitative surveys or formalistic structured interviews that could be linked with statistical generalisation. Given these conditions, this study suits the qualitative case study approach, which involves a deep analysis of both phenomena and contexts.

However, we also need to consider external validity; that is, empirical data collected through the research must be generalised so that a theory led by the case study can be applicable to universal social reality. In this regard, qualitative case studies cannot adopt random sampling (Seawnght & Gerring, 2008) nor confuse a single case study with 'a sampling unit' like a single subject in an experiment, both of which are rationales for statistical generalisation. Instead, we should use 'analytic generalisation', in which a formerly developed theory is examined by comparing the empirical results of subsequent case studies. In doing so, case study investigators can adopt 'replication logic' to make the findings more compelling. With similar results (a *literal replication*) or contrasting results but for predictable reasons (a *theoretical replication*), the original finding can be considered robust (Yin, 2003). One thing to note, however, is that such case studies cannot reveal the prevalence of phenomena.

A multi-case study for comparative purposes could explain different outcomes (in this thesis, the Imagined Publics) from different parameters (in this thesis, the differences between countries) as input, which could thus contribute to a theoretical replication. However, I must keep in mind that the findings of this study will not be self-sufficient and will need further examination. In this regard, I adopt supplemental data on different topics, aiming at strengthening literal replication, which I will address in Section 3.6.

3.5. Case in the Thesis: Genome Editing in Japan and Mitochondrial Replacement Technology in the UK

This thesis specifically focuses on the policy dialogues pertaining to genome editing held by the Expert Panels on Bioethics at the Council of Science, Technology and Innovation in Japan. For comparative analysis, it also examines policy dialogues surrounding mitochondrial replacement

technology held by the expert review panel of the Human Fertilisation and Embryology Authority in the United Kingdom. These policy debates seem to fit the aforementioned criteria, considering the points below.

Consideration 1: The Theatre of the Drama

According to Graham, the best comparisons are not 'made between entities that are totally different; rather, they emerge when one studies entities that are similar enough that some common elements can be seen but different enough that the variations can be studied' (Graham 1998). In this regard, I choose the two cases mentioned above, viewing them as similar in several technical aspects but different in terms of cultural background.

First, concerning political customs, the UK, like Japan, has a strong tradition of bureaucratic commitment to policymaking, although the underlying political cultures are different, as elaborately described in subsequent case study chapters. Technically, the HFEA is a non-departmental public body or so-called arm's-length body, so it is not strictly a government organisation. Nevertheless, it is tightly connected with the sponsoring department (Department of Health), and as revealed in interviews, the administrative staff consider themselves as civil servants. Therefore, this thesis will not strictly distinguish the HFEA from governmental organisations but identically recognise it as a public policy institution, while separating charitable bodies that are deeply engaged in the discourse, such as the Nuffield Council of Bioethics or Wellcome Trust, from governmental organisations and categorising them as a sort of stakeholders.

Second, both the UK and Japan could be regarded as countries with a high presence in research and development in scientific fields. According to the survey published by the National Institute of Science and Technology Policy in Japan (NISTEP), both countries ranked among the Top five countries in research paper publication during the period when the policy

deliberations took place (2010-2018) [10]. Thus, in terms of the technological or economic level, they are not in significantly different circumstances.

Third, while they could see similar bureaucratic commitment, their cultural backgrounds are considerably different. Particularly regarding PEST or democratic movements in scientific governance, which was initially developed in Western culture, the UK could be a good reference for Japan to compare the cultural backgrounds.

Considering these aspects, policy debates surrounding CSTI in Japan and the discourse around the HFEA and DoH in the UK can be assumed as eligible cases for comparison in line with the purpose of the thesis.

Consideration 2: The Topic of the Drama

Regarding the issue at stake, concerns pertaining to both technologies are mainly centred on genetic intervention in human embryos, although the two policy debates revolved around technically different technologies. This implies that similar, if not identical, social concerns toward each technology could emerge in both countries, and their contextual implication of the technology for policy discourses could be similar to each other. Indeed, the scope of the expert committee in Japan included mitochondrial transfer as well as genome editing. In addition, while there have been no explicit policy debates on genome editing in the UK, the first application for embryonic genome editing in the UK, which turned out to be the world's first-authorised project, was approved through the same procedural ethical review process as that for mitochondrial replacement. Therefore, at least in the realm of policy, both technologies are treated as being equal. Such circumstances could reduce the parameters to be considered in the comparison–in other words, the two cases could be useful in highlighting the influence of differences in the Imagined Publics and accompanying conceptions of democratic legitimacy in

[10] NISTEP, Japanese Science and Technology Indicators 2012, 2014, 2015, and 2017. https://www.nistep.go.jp/en/?page_id=52

selected countries, which could prescribe how the publics are treated in the actual science policy arena.

Scientific context: genetic intervention

Genetic intervention technologies have been widely used in our society, and the terminology used in the field is no longer specialists' jargon. Before digging into each case study, I would provide some contextual (rather than technical) information on the technologies and how they are discussed in the STS literature.

The term '***genome***' was originally coined in 1920 by German botanist Hans Winkler (Lederberg & McCray, 2001). He created this word to describe 'the haploid chromosome set, which, together with the pertinent protoplasm, specifies the material foundations of the species' by adding '***-ome***' (a suffix which connotes 'totality' or 'entirety') to the word '***gene***'. However, while Winkler tried to refer to some concrete objects with the word 'genome', this term was still conceptual since the term 'gene' can also refer to an abstract image of an inherited instruction to construct and maintain a body (Starr, 2018).

After Hershey and Chase proved Deoxyribonucleic acid (DNA) carries genetic information (Hershey & Chase, 1952), and Watson and Crick discovered the double-helix structure of DNA and its sequence as a genetic information code (Watson & Crick, 1953), DNA became almost a synonym for the word 'genome'. This phenomenon meant two things; ontologically, it meant that the abstract concept of genetic information was materialised into a tangible form of objects; and epistemologically, it meant (at least for some people) that this molecule was supposed to represent all living organisms, playing the role of an information system for an organism's totality (Kay, 1998; Keller, 2011). Consequently, the sequence of DNA molecules has been in the spotlight of scientific research, and enormous advancements have been made in understanding the genetic system, such as the mechanisms of

genome replication, gene expression, and its regulation in prokaryotes and the viruses that infect them, all focusing on DNA sequence. Moreover, this materialisation of the 'genome' led people to seek to modify it or, more precisely, manipulate this machinery by changing the DNA sequence.

The DNA sequence can be easily altered by nature. While widely used among all living things, DNA codes are naturally vulnerable to mutation, and errors can easily occur when cells replicate their DNA. Therefore, every cell has its own repair system, but if the errors are not repaired correctly, they can lead to a change in genetic information. Viral infections, chemicals, or radiation can also alter the DNA sequence. Through these alterations of a sequence that codes a gene, either problems or advantages can arise; however, they happen randomly and are not controllable.

This problem led to further research for modifying genomes in controlled manners. The initial milestone achievement in this line of study was the development of recombinant DNA technology, which enabled people to cut and splice DNA fragments, and let them be cloned and expressed in cells (Berg & Mertz, 2010; Russo, 2003). This technology realised the introduction of a transgene (a foreign DNA which codes specific genes) into an organism, that is, transgenesis. In 1973, the first report of the application of this technology into bacterial cells was announced (Cohen et al., 1973), but in the very next year, this recombinant DNA technology was used to create genetically engineered mice (Jaenisch & Mintz, 1974). These events indicated that people would be able to modify the gene expression and the future of an organism at the genomic level. Since then, transgenesis technology has become a robust research tool for biological researchers, and it has rapidly become common in life science.

On the other hand, this technology still had some limitations. It only allowed genes to be added through the introduction of foreign DNA into a cell and had little control over where the added genes would be inserted into the

whole genome, posing risks of collapsing indigenous genes. Therefore, when it comes to precise use, especially for therapeutic purposes, clinical practitioners remained concerned about the accuracy of transgenesis technology and its unpredictable side effects, and they called for more precise and effective alternatives. It was at that moment that mitochondrial replacement and genome editing technology appeared on the stage.

Controversies over genetic technologies and debates

Rather than just a tool in biological research, genetic technologies described above have the potential for application in various areas socially at stake, such as agriculture and medical use (Hussain et al., 2019; Jaganathan et al., 2018; Ricroch et al., 2017; Zhang et al., 2017). On the other hand, the technologies have also prompted social concerns about their uncertain consequences.

As described above, the technology, which can alter a person or their offspring's genetic information, has therapeutic prospects for diseases caused by particular genes that are beyond ordinary remedies. At the same time, this could entail concerns about superhuman 'designer babies' (see such as Shelley et al., 2017), and MRT and genome editing are no exception (Morrison & de Saille, 2019; Nuffield Council on Bioethics, 2012, 2018). It has also given rise to unease over potential eugenic attitudes that draw boundaries between normal and disabled, which aims to eradicate genetic disabilities (Buchanan, 1996). Due to these and other ethical and social concerns, genetic intervention technology, including its derivatives, has evoked tension or controversy between promotion and moratorium since its emergence (see such as Jasanoff, 1995; Lander et al., 2019). In this regard, it should be noted that Dimond and Stephens have observed the MRT policy deliberation in the UK, the same case this thesis will deal with (Dimond & Stephens, 2018). Employing the analytical framework of sociotechnical imaginaries, they revealed the country's stance that 'embryo research and use is rendered ethical through a permissive but highly scrutinised system'.

We could interpret that the controversy began with the International Conference on Recombinant DNA, convened in February 1975 at the Asilomar Conference Center in Pacific Grove, California, which I mentioned in the previous section (Hurlbut, 2015). The scientists who participated in the conference were primarily concerned with how they could assess the safety of the technology, so the established guidelines for researchers only considered technical issues about risk assessment within the operation in laboratories, reflecting the experts' technical concerns in their daily laboratory work. The agenda was minimised into its potential risk of 'biohazard', such as the possible pathogenicity of the recombinant DNA and infected organisms or their harmful effects on the ecological system if such potentially hazardous agents spread from laboratories (Berg et al., 1975). Their guidelines were admittedly stringent but dealt only with technical and methodological issues, and they proposed a defer of research only if the DNA used in the research was derived from extremely pathogenic organisms. They restricted *what* was used in their research or *how to* conduct an experiment, stemming only from their concerns in their daily routine in laboratories, but did not consider *why* or *for what purpose* they could conduct research. Neither did they put their focus on social issues, such as how these technologies might be used or how they might influence our social lives, which may concern people outside the academic field, including the publics.

The Asilomar controversy implies that we should pay attention to which concerns are discussed and by whom such concerns are put in the spotlight. In the subsequent chapters on case studies, I will dig more into them in each case.

Corpus Collection

The collection of corpora in this study entails the purposive sampling approach. Thus, the collection of materials is conducted with reference to the

research questions. Given the hypothesis and research questions described above, the analysis of this thesis draws on two corpora:

Corpus 1: Committee proceedings or other official documents

The most important thing in my case study is to collect information about what happened in the advisory committees. Thus, committee proceedings or other official documents related to the committees are the principal sources of information. Most of the documentation published by the governments and other organisations was archived online. Therefore, the study collects published documents regarding the policy discourses to the best of the author's ability, without arbitrary selection.

In cases of Japan, the meeting materials, including draft reports, final reports and proceedings of the Expert Panel on Bioethics of the CSTI and the Task Force under the Expert Panel are disclosed on the web[11]. It is worth noting that the proceedings above are quite detailed; they are verbatim reports and even contain the names of speakers; therefore, all remarks and comments are precise at a word-by-word level and can be attributable. Therefore, these resources could be good data for the case study. Additionally, I collect media coverage regarding the issues on the web.

While the policy debates have not reached a conclusion yet, we could divide these debates from 2016 to 2019 into mainly three stages: the first, from the beginning to the publication of the interim report; the second, the severe backlash from the academic community and the launch of the task force, followed by the establishment of the guideline for the basic research of embryonic genome editing; and final stage which discussed the legal governance on the clinical use of the technology, which is stated in the second interim report of the TF. Therefore, the overall controversy over the

[11] https://www8.cao.go.jp/cstp/tyousakai/life/lmain.html

technology can also be regarded as a set of three cases, which can make the findings and resulting theory even more robust.

This study covers more than 45 meetings in total, as listed below. All information was openly obtained via the CSTI website[12]. All quotes were translated into English by the author.

Table 3.1. Source materials list (Japan)

Act	Host organisation	Committee	Period	Available sources	Notes
1st	CSTI	The Expert Panel	Jun 2015–Apr 2017 (15 meetings)	Proceedings Materials Report	
2nd	CSTI	The Expert Panel	May 2017–May 2018 (5 meetings)	Proceedings Materials	Including a joint meeting (1 meeting)
		The Taskforce	Jul 2017–May 2018 (7 meetings)	Proceedings Materials Report	
	MEXT MHLW	The joint advisory committee	May 2018–Nov 2018 (5 meetings)	Proceedings Materials Guideline	
3rd	CSTI	The Expert Panel	Jun 2018–Jun 2019 (8 meetings)	Proceedings Materials Report	Including a joint meeting (6 meetings)
		The Taskforce	Jun 2018–Apr 2019 (12 meetings)	Proceedings Materials	
	CSTI	The Expert Panel	(on-going)	Proceedings Materials	

Similar sources were collected regarding mitochondrial donation cases in the UK. The official reports from HFEA[13], Nuffield Council[14] and Sciencewise reports[15] were obtained from their website. Some documents published by HFEA were no longer available on their website; instead, they were obtained from The National Archive website[16].

[12] https://www8.cao.go.jp/cstp/tyousakai/life/lmain.html
[13] https://www.hfea.gov.uk/treatments/embryo-testing-and-treatments-for-disease/mitochondrial-donation-treatment/
[14] http://nuffieldbioethics.org/project/mitochondrial-dna-disorders
[15] https://sciencewise.org.uk/projects/mitochondrial-replacement/)
[16] https://webarchive.nationalarchives.gov.uk/*/http://www.hfea.gov.uk/

Table 3.2. Source materials list (UK)

Host organisation	Committee	Period	Available sources
Government	1st inquiry	Jan 2011	Report
HFEA	1st review	April 2011	Report
Department of Health	2nd inquiry	Jan 2012	Report
Nuffield Council	Report	Jun 2012	Report
Sciencewise	Public dialogue	Jan 2012- Feb 2013	Report
HFEA	2nd review	Jan 2013	Report
	Advice to Government	Mar 2013	Report
Department of Health	Public consultation	Jun 2013	Announcement Result report
HFEA	3rd review	Jun 2014	Report
Department of Health	A new HFE Regulation	Oct 2015	Report
HFEA	4th review	Nov 2016	Report

Corpus 2: Semi-structured Interview data

The interviews I conducted were semi-structured, which basically encompassed several themes and key questions but were nevertheless flexible so that the entire interview could be accomplished as a natural conversation. Open-ended interviews can let the interviewee reveal their own perspectives rather than choosing pre-set answers. On the other hand, we must acknowledge that there could be an inevitable gap between what they think and what they talk about social reality, especially with intelligent, reflexive interviewees or those with specific *public* roles.

All conversations were recorded using a digital audio recorder and a mobile phone as a backup. All record files and transcripts were stored in the password-secured server provided by University College London. For privacy protection, all data were pseudonymised soon after the interview so that the interview data would no longer be attributed to an identifiable natural person without the use of additional information, which was kept separately. On the

other hand, my research focused on the impacts of the affiliations or roles; therefore, I used several designations related to their roles in the thesis.

Regarding sampling in the interview, I basically followed a purposive sampling strategy. I generally selected interviewees from those who are deeply involved in the policy discourses in and around advisory committees and subsequent policymaking processes. Thus, I chose potential interviewees from the key groups in the science-policy-making process, categorising them into three classes: the expert members of advisory committees, the secretariat of the committees and other administrative officials in public policy institutions, and other people such as trust staff or non-expert committee members. Regarding administrative organisations, I mainly asked to interview senior staff, who have the mandate to make a decision. On the other hand, I also asked more junior staff who are involved in preparing the actual materials or draft because they can know the actual work inside the organisation better. However, due to the limited accessibility toward appropriate interviewees at the current stage, I also adopted the snowball sampling approach in this interview (i.e., ask initial participants to introduce their friends or recommend people I could approach). The anonymised interviewee list is as below.

Table 3.3. Interviewee List

	UK	JPN
1	HFEA Panel Member (clinical scientist)	Panel Chair
2	HFEA Staff	Civil servant (secretariat)
3	HFEA Panel Member (developmental biologist)	Civil servant (secretariat)
4	Anti-Campaigner	Civil servant (secretariat)
5	HFEA Panel Chair	Civil servant (secretariat)
6	Religious Group Representative	TF member (journalist)
7	Patient Group Representative	TF member (patient group representative)
8	HFEA Panel Member (clinical scientist)	TF member (medical doctor/jurist)
9	Civil Servant (GoH staff)	Civil Servant
10	Civil Servant (GoH staff)	Ex-civil Servant
11	Ex-HFEA Staff	Civil Servant
12	Trust A staff (support legalisation)	Civil Servant
13	Trust A staff (support legalisation)	Civil Servant
14	Trust B staff (support legalisation)	Civil Servant
15	Trust B staff (support legalisation)	Civil Servant

The methods regarding interviews obtained approval from the UCL STS research ethics committee. The list of questions for interviews is given in the Appendix. All quotes of Japanese interviewees were translated into English by the author.

3.6. Additional Data Collection Regarding Policy Atmosphere in the UK and Japan

This study focuses on the difference in recognising democratic legitimacy in decision-making across societies, particularly highlighting the uniqueness of one in Japan. However, I acknowledge that this type of argument could be relatively ambitious and thus will need more evidence than a single case study can provide to justify the claims. Also, as Johnson notes in his book (Johnson, 1999), this argument could face criticism that such differences from Western standards stem from the level of democratic development in society, suggesting some inferiority to Western standards. To address this, I conducted additional interviews with other actors around science policy, not necessarily those involved in the policy dialogues on

genome editing. These were also conducted in the same manner as the one adopted in the case study on genome editing. Also, I collected media coverage regarding the various issues regarding science policy from the web.

3.7. The Detection of the Imagined Publics

The Imagined Publics were detected from the data collected according to the procedure above. It involved qualitative document analysis that entails some interpretation. Each sentence or phrase was coded and categorised according to occasions, speakers' positions, or specialities, with the aid of the analytical software NVivo. In particular, I collected phrases that indicated or implied assumptions about the actor's status or positioning, as well as their relationship with other actors. By doing so, I detected some shared or common assumptions.

3.8. Chapter Conclusion

In this chapter, I have described the hypothetical claim of my research in light of previous studies on public engagement in science policy. It is difficult to directly examine how people recognise policy decisions as legitimate and how the publics are situated in the actual science-policy processes, not to mention the linkage between them. Therefore, I have adopted the Imagined Publics as an analytical lens for analysis. Given the previous studies on social imaginaries and their influence, it could presumably be possible to understand these points through the analysis of the Imagined Publics.

It should be noted that at the same time, I also assume the Imagined Publics to be a possible key factor that can bridge those two notions in light of the performative effect of the social imaginaries, which in turn reflect the social meanings of actors. If the Imagined Publics shared in a given science-policy custom reveal how their construction can be influenced by local

conceptions of democratic legitimacy in decision-making and how they are materialised in real science-policymaking practices, it would be possible to argue that they could be linked via the very Imagined Publics.

With regard to the methodological approach, a qualitative comparative case study is a promising method for the research questions I address in this study. The explanation of the feature of the Imagined Publics, as well as the conception of democratic legitimacy, needs an in-depth examination of the contextual perceptions embedded in tangible evidence, which is difficult to be approached by quantitative analysis. In this regard, the study conducts semi-structured interviews in combination with qualitative document analysis of the related proceedings, policy reports, other materials as well as media coverage. Considering the difficulty in interference, this study adopts a comparative case study, which can make the resulting arguments more compelling by theoretical replication logic. Also, it is of note that the comparative approach can 'help us identify and make sense of the wider political realignments that are taking place around us at this moment' (Jasanoff, 2005c).

To highlight the cultural difference in the democratic conception of legitimacy, this study chooses the policy discourses on mitochondrial replacement technology in the UK on the one hand and the policy controversy over embryonic genome editing in Japan on the other. These cases are quite similar in terms of bureaucratic intervention and the technology at stake. On the other hand, it could be fair to consider that these two countries may have different views on democratic legitimacy in decision-making.

At the same time, the study includes some unusual approaches: interviews with Japanese science-policy actors in general and analysis of media coverage on scientific issues in Japan, which is not bound to the case to be analysed. Such complementary analysis should be necessary if a study aims to challenge well-accepted conceptions such as one about democratic

decision-making that is shared in previous STS. While it could be easy to dismiss Japan's political culture as inferiorly undemocratic, measuring it by Western standards, I would argue that the difference should be treated without such bias, considering Johnson's study (1999) on developmental states as well as the STS tradition of addressing differences without any value bias.

In hindsight, the hypothetical claims of the study could reflect my personal view that it is unfair to disparage the bureaucratic decision-making custom in Japan as undemocratic. This view is influenced by my heuristic knowledge as an administrative staff in the Japanese government, which could arouse a sympathetic evaluation of civil service in the country. However, through the daily communication with officials, I have found it could be somewhat superficial to criticise them as autarchical and anti-democratic. I must keep this subjectivity in mind, but nevertheless, a study from a different viewpoint could still be of some use, given that constructivist STS literature avoids the positivist conceptualisation of the social world.

Chapter 4: Mitochondrial Replacement Techniques in the UK

As outlined in the preceding chapter, my research comprises a comparative case study examining two policy discourses, which aims to illustrate the Imagined Publics and the conception of democratic legitimacy shared around them. In keeping with this objective, the present chapter delves into the first case: the UK's policy deliberation over mitochondrial replacement techniques (MRT) on human embryos.

The chapter is divided into three compartments. Firstly, I will provide some contextual information, including the technical background of the technology in question, followed by an overview of the policy framework and relevant actors involved in the case. Secondly, I will analyse the recognition of the role of and relationship with different players, accompanied by the investigation into the Imagined Publics in the case. Finally, I will address the relationship between Imagined Publics and legitimacy that could permeate into the actors involved in the case (and possibly, even the UK society as a whole). The three-part structure will also be employed in the next chapter, which deals with the Japanese case, to facilitate the comparison of the two cases in the subsequent chapter.

As revealed in the subsequent sections, there existed a division between science and others, predicated on the notion that science is free from values. Additionally, there was a clear division among members of society (i.e., the publics), between those with family members afflicted with mitochondrial diseases and those without. Based on these divides, there was the imaginary of science closely connected with values: specifically, the idea of *science for patients*. These seemingly incompatible recognitions resulted in the marginalisation of negative opinions toward the techniques. Such divergent

Imagined Publics may have also caused those around the advisory panel to pay more attention to a particular part of publics over the others.

In the analysis, I will also pay attention to the role played by administrators in policy discourses. The provided regulatory and procedural frameworks do not openly take their involvement into account. However, they undoubtedly contributed to the policy discourse in their own unique way, which is neither like advisors nor elected politicians.

4.1. Background

Context 1: Background of the Technology at Stake

MRT, the technology at stake in this chapter, is a variation of the IVF (in vitro fertilisation) technique that alters the mitochondrial DNA of an egg or embryo by using a portion of a donated egg.

Mitochondria are small organelles found within our cells that provide the essential energy necessary for cell functioning. Their function and replication involve both mitochondrial DNA (mtDNA) and DNA in the cell nucleus. However, while we receive nuclear DNA from both our mother and father, mitochondrial DNA is inherited only via the mitochondria in our mother's eggs, thus giving rise to the term 'maternal inheritance'.

There are several characteristics of the inheritance of mitochondria, which are more complex than nuclei. For instance, a cell in an adult's body can contain a varying number of mitochondria ranging from a few hundred to several thousand. During reproduction, a small number of the mother's mitochondria are selected to populate all the cells of the offspring in much higher numbers. This indicates that a small number of mutated mitochondria can become the majority through development. Furthermore, mitochondrial dynamics and function (including replication) depend on genes encoded by the nucleus; therefore, defects in the interaction between the nucleus and

mitochondria can also affect the replication and activity of mitochondria. However, information on mtDNA and mitochondrial diseases was not well understood at that time and has not yet been entirely clarified.

Mutation in the mitochondrial DNA can cause inherited genetic disorders, particularly in organs with a high need for energy, such as the brain, heart, kidney and major muscle groups. Thus, mitochondrial mutations can cause a range of severe health problems, which can be fatal. However, because of the complexity of the inheritance of mitochondria, mitochondrial diseases can have several differences from other genetic diseases related to nucleus genes. First, mitochondrial disorders can result from either source of DNA, and mtDNA has a higher mutation rate because there are far more mitochondria per cell compared to two pairs of DNA in the nucleus per cell. The mtDNA tends to be replicated with a higher rate of errors than DNA in nuclei. Also, due to the number of mitochondria per cell and the selection in reproduction, mothers with no experience of symptoms can pass on mitochondrial disorders.

Mitochondrial replacement gives women with mtDNA disorders hope of having their genetically related children without such mutation. Previously, there were several options for preventing the transmission of inherited mitochondrial DNA disorders: Preimplantation genetic diagnosis (PGD) and egg donation. PGD can be used to test embryos that might carry mutations in their nuclear DNA to select unaffected embryos for implantation. However, this technique is only possible if causative mutations are known, and there is still a risk of passing on mutated mitochondria. Moreover, PGD does not completely eliminate the risk of mtDNA disorder in future generations, as the selected embryos may still have some mutated mitochondria. Egg donation can also avoid transmitting mtDNA diseases, but any resultant child will not be genetically related to the mother.

There are conceptually three timings to alter nuclear DNA: maternal spindle transfer (MST), pronuclear transfer (PNT) and cytoplasmic transfer. MST uses two unfertilised eggs, and the 'spindles' of chromosomes in the intending mother's eggs are placed into the enucleated donor eggs with normal mtDNA. The inserted egg can then be fertilised with sperm from the intending father or a sperm donor, using the IVF technique.

PNT, on the other hand, takes place in a later phase than MST. First, IVF is used for creating intending parents' embryos (zygotes), which contain the mother's mutated mitochondria. Before further development of cell division, the genetic materials of the sperm and egg still exist separately as *pronuclei*. The two pronuclei are then removed and then placed into the donor's enucleated zygote. The third technique, Cytoplasmic Transfer, takes place before fertilisation and entails injecting some ooplasm (the cytoplasm of the egg, which contains mitochondria) of a donor egg into the oocyte of the intending mother.

Overall, MRT is somewhat different from so-called 'genetic modification', given that the technique does not directly alter the DNA sequence of nuclei. Nevertheless, this technique would involve other mtDNA than one of the parents, which could be the point of technical arguments in the policy discourse described in the following sections, depending on the value standpoints of people. Some could argue that the techniques are equivalent to the genetic intervention of embryos and problematic in much the same way as those previously discussed technologies, but others can insist that they are different from gene modification and free from previous concerns.

Context 2: The Theatre and Actors in the Drama

An intensive policy discourse on MRT in the UK began in 2011, but it has a bit longer history before that. The 1984 Warnock Report concluded with the recommendation for a regulatory framework for embryonic research to

sophisticate scientific and medical practices in this area. Thereafter, the original Human Fertilisation and Embryology Act 1990 (HFE Act 1990) was enacted, which only permitted eggs and embryos without altering their nuclear or mitochondrial DNA to be used in clinical situations.

The Human Fertilisation and Embryology Authority (HFEA) is an independent public organisation, statutorily established in 1991 based on the very HFE Act 1990. It was set up as an arm's-length organisation of the Department of Health, which works independently on behalf of the Government. Since then, the organisation has been at the centre of the regulation of research using human embryos in the country, playing roles such as licensing, monitoring, and inspecting clinics; setting standards for clinics to improve care; managing and analysing information about fertility treatment; producing trust-worthy information for the public; and engaging with the sector and others interested in embryo research[17]. Over time, however, the regulator's role shifted to running the sector as a whole, which means it considers not only patients but also the wider society and safeguards the individuals and establishments working within the sector (Abdalla, 2009).

Regarding policy administrators, it should be noted that civil service in the UK has been regarded as the generalist policy elites of this country. The civil service with policy profession, or staff surrounding Whitehall, comprises only a small part of the whole public service in the UK. The traditional sociology of these civil servants was characterised as those with higher socio-economic backgrounds: white, male and Oxbridge (Oxford and Cambridge) graduates. Another tradition in the UK civil service could be described as a group of generalists (Page & Jenkins, 2011). Actually, most civil servants did not have a 'professional degree' directly concerned with government, public administration or public policy.

[17] https://www.hfea.gov.uk/about-us/our-people/

While this tradition has steadily changed, the fundamental conceptions still exist, or at least, existed when the deliberation took place (Talbot, 2014). Despite the introduction of open recruitment to senior civil service positions, most entrants are recruited internally (Public Administration Select Committee, 2010), which is quite different from specialist recruitment in the US (Peters, 2015). Also, a survey in 2019 revealed the majority of executive positions in civil service are still occupied by Oxbridge graduates. The selection is based on CVs, personal statements and interviews[18], focusing on transferable general competencies rather than specialist knowledge or experience. The recent introduction of a section for STEM degree holders in the 'Fast Stream programme' could even reflect the limitation of specialist recruitment in the previous system[19].

4.2. Case Analysis

Division Spread in the Arena

The policy drama commenced in February 2011, when the Secretary of State for Health solicited the HFEA to conduct a scientific review to scope 'expert views on the effectiveness and safety of mitochondrial transfer'. Until the Parliamentary approval and the fourth technical review subsequent to the vote, there were different types of conflicts, deliberations and compromises.

In the course of the story, the case saw the different types of divisions held by the actors. I will introduce these divisions in the ensuing sections.

Science and Anything Else

We could see the first division in the HFEA's response to the government's request in February 2011, wherein the authority established an independent panel (hereafter 'the Panel') to collate and summarise scientific

[18] https://www.civil-service-careers.gov.uk/how-to-apply/
[19] https://www.faststream.gov.uk/government-policy/index.html

evidence from a broad range of experts in relevant fields, such as developmental biology and medical genomics. The membership consisted of six of the country's distinguished scientific experts, including Professor Neva Haites and Dr Robin Lovell-Badge as co-chairs, along with Professor Peter Braude, Professor Keith Campbell, Professor Sir Richard Gardner, and Professor Anneke Lucassen. Notably, the membership excluded specialists in other fields such as ethics, law, and other social sciences. Nor did it involve so-called laypeople like patient group representatives. In other words, they isolated science from any other issues. While the Panel was established four times throughout the debates, the above understanding of the role of the Panel and the distinction had been maintained in its membership. Each Panel was comprised of only professionals with clinical or scientific backgrounds, excluding specialists in other fields (i.e., ethics, law and other social sciences).

In harmony with the membership, from the beginning, the Panel was articulately described as purely scientific, excluding ethical and legal issues around techniques from its scope. While we could see this understanding of the role in the interview with advisors, it was not constructed solely by themselves but instead shared with or even provided initially by others. In the Panel's inaugural meeting, the HFEA staff clarified the purpose of the Panel:

> '*The HFEA established a panel to collate and summarise the current state of expert understanding on the safety and efficacy of methods to avoid mitochondrial disease through assisted conception*. PT clarified that ethical issues are not within the scope of the review' (Minutes of meeting morning presentations and discussions, 25 March 2011, emphasis added)

Moreover, this notion was also embedded in the inquiry by the Department of Health:

> 'The Human Fertilisation and Embryology Authority (HFEA) agreed, in February 2011, to a request from the Secretary of State for Health to scope "*expert views on the effectiveness*

> *and safety of mitochondrial transfer*"' (HFEA website, archived on 15 November 2011, emphasis added)

Therefore, the understanding of the advisory panel as purely scientific was widely shared among policy actors, especially around policymaking institutions.

This division between science and anything else was not only evident in the Panel but also in the Authority memberships, which comprise people with various backgrounds, including ethical, legal and social specialists and patient representatives. The annual reports of the HFEA for 2010/2011 and 2011/2012 listed the authority members with the category of their possession[20][21]. While clinicians and biomedical researchers were classified as 'professional', those with other expertise were grouped as 'lay' together with patients or broadcasting executives. Although this categorisation has not been seen since 2012/2013[22], it likely indicate a clear distinction between 'science' and 'anything else', at least at the beginning of the policy discourses on MRT.

If so, the assumption behind the membership or their pamphlets could be different from the ordinary notion of the 'deficit model' of public understanding of science, which distinguishes 'those who have expertise' from 'others who do not have'. But why did they implement such a division? Through the interview, we could see there were practical concerns in the policy discourse. When asked about their experience as a scientific advisor in expert committees for policymaking, a clinical scientist began by expressing concern about the other members' competence in judging highly technical issues.

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[20] Human Fertilisation and Embryology Authority. (2011). *Annual Report and Accounts 2010/11*. https://doi.org/10.1051/medsci/20082411997
[21] Human Fertilisation and Embryology Authority. (2012). *Annual Report and Accounts 2011/12*. https://doi.org/10.1051/medsci/20082411997
[22] Human Fertilisation and Embryology Authority. (2013). *Annual Report and Accounts 2012/13*. https://doi.org/10.4324/9781315148441-10

> '[I]t is clear to me that the very first thing that any specialist advisor, any specialist person, comes here to, in my own opinion, is that you have to get the science right first. You cannot make any ethical decision, you cannot have any legal discussion until you understand the science.' (Interviewee 8, clinical scientist)

They recognised that the ethical issues accompanied by scientific issues could not be free from the very science, which requires scientific knowledge around the issues as background information. In their view, scientific understanding is necessary for comprehending what is at stake in the issue.

In addition, according to the HFEA staff, the discussion at the Panel was for assessing scientific and clinical issues around the use of technology:

> 'So, what we wanted was just a narrow assessment from a scientific and clinical perspective as to whether or not the research conducted today suggested that it might be a responsible thing to consider this new treatment as being a safe action or not. And to that extent, all of those reviews we did were effectively a conversation between technical experts who then wrote us reviews.' (Interviewee 2, HFEA staff)

Also, the staff mentioned that scientific knowledge means competence in the assessment of technology, just as the advisor said:

> 'So I don't think there's a need for sort of oversight committees and the like in such sort of arrangement. Because, you know, it is, as I say, it is more about technical competence. One of the reasons we didn't have non-scientists, non-clinicians on that panel was actually they're not in it. You know, if you don't have the kind of technical competence, you're not in a position to be able to interrogate the evidence at the technical level.' (Interviewee 2, HFEA staff)

They were aware that the Parliamentarians would officially make the final judgement, including ethical and social issues, and that the primary purpose of the Panel was to provide independent sets of assessed information regarding technical issues for decision-makers (i.e., the Governmental staff and Parliamentarians). In turn, the jurisdiction of the Panel was limited to the scientific review. In this regard, they made a clear division of labour between the Panel and other policy organisations.

Patient and Others

Despite the understanding of the Panel's role and its membership, the discourses were not free from value judgment shared among policy actors. In the policy discourse on MRT, there was a strong notion that the technology was for those who suffered from the inheritance of mitochondrial diseases. In any reports, regardless of the publishing organisation (HFEA, Department of Health, Nuffield Council of Bioethics), the technology was consistently articulated as the solution for preventing diseases:

> 'Mitochondria are small structures present in human cells […]. Mutations in this mitochondrial DNA can cause a range of rare but serious diseases, which can be fatal. *However, there are several novel methods with the potential to* […], *and thus avoid mitochondrial disease in the child and subsequent generations*' (Executive summary, the 1st Scientific Review report, emphasis added)

> 'The Nuffield Council on Bioethics conducted a six-month inquiry into the ethical issues raised by *new techniques that aim to prevent the transmission of maternally-inherited mitochondrial DNA disorders*' (Foreword, NCOB report, emphasis added)

> 'This consultation seeks the views of stakeholders and the wider public about draft regulations to allow *newly developed treatment techniques to prevent the transfer of a serious mitochondrial disease from a mother to her child*' (Executive summary, government's public consultation on draft regulations, emphasis added)

To analyse the relationship among people in this policy discourse, let me dig into how the patients and other publics are framed in the discourse on mitochondrial diseases. In particular, it must be carefully noted that mitochondrial diseases can be seen in children from mothers without any symptoms. A study in 2008 found that one in 200 children is born each year with a disease-related mutation[23]. In most cases, such a mutation causes only mild or no symptoms, but the next generation of people without severe diseases can be born with fatal mitochondrial disorders. Thus, this technology is not directed to the patients themselves but the prospective children; more precisely, the factual information indicates that the technology could be

[23] NCOB report (2012), section 1.22

concerned with everyone. However, this rhetoric of 'prevention of disease inheritance' can be mixed with the notion of 'technology for patients', which established the patients and their families as a key stakeholder group and fixed the target of the technology and related policy. Indeed, beyond the description of the technology, the public dialogue report and the advice to the government also put the patients as the central figure.

The public dialogue project conducted by the HFEA and Sciencewise involved an independent patient focus group in addition to other public engagement programmes such as deliberative workshops and open consultation meetings, which means that the patients or their families were treated with special consideration. In the focus group, participants were recruited through patient groups, but the report provided little explanation of how the six participants were selected or of the questions asked in detail. On the other hand, the HFEA asked the patient groups to advertise the focus group through their network, and patients were also approached at the open meetings.

However, the overall conclusion in the scientific review that the technology was 'not unsafe' also entailed ethical consideration. In particular, clinicians, who had opportunities for daily communication with patients, brought an insight that is different from their scientific expertise.

> 'So my role as a clinical geneticist, I was appointed to the committee because I could report on the experiences of families affected by these conditions. For several decades, I've seen families in my clinic with these very rare mitochondrial disorders, and spent a lot of time with them explaining the inheritance and the limited options that they have if they want to try and have healthy children.' (Interviewee 1, medical scientist)

The clinical specialist was confident in their own judgement because they could make a scientific evaluation, but at the same time, they could also take patients' opinions and thoughts into their consideration for the evaluation. While they had professional clinical science expertise, their

arguments entailed ethical considerations based on their daily experience with their patients. In the interview, the clinical scientist explained the ethical stance toward patients, in which they were standing by the side of patients:

> 'So it's very easy for ethical arguments to become polarised, and perhaps for the perception to be that the ethical arguments rule on just one side and–against trying to develop something new. But patients, on the other hand, will argue the exact opposite and say, "*It's unethical not to try and help us if you have the technology that could potentially do so*".' (Interviewee 1, emphasis added).

Consistent with these notions, the reports and resulting policy outputs favoured enabling the technology to be delivered to those who needed it. Therefore, the commitment of clinical specialists could provide different standpoints in deliberation among scientific experts, making it more inclusive. The patients' perspective could offer an alternative to expert views on the technology, which could navigate the value judgement toward the patients' preferences. In contrast, the views of others, or so-called ordinary people, were not involved in this manner. In other words, while patients were conceptually engaged in the expert policy deliberations, the other citizens did not possess such a path to join the debate.

The Division Occurred before the Drama

To comprehend the case, we should turn back our clock a bit more. Indeed, an intensive policy discourse on MRT in the UK began in 2011, but by then, the policy drama on the technology had already completed its first Act. When the Act was amended in 2008, there were specific discussions on the welfare and prospects of patients with mitochondrial disorders. However, since there was no established technique for them at that time, the amended Act granted powers to the Secretary of State for Health, when they were minded to do so, to create regulations. It also required any changes in the law to be approved by Parliament to monitor the work of the government. The inserted 3ZA (5) HFE Act 1990 (as amended) stated that:

> ‘Regulations may provide that - (a) an egg can be a permitted egg, or (b) an embryo can be a permitted embryo, even though the egg or embryo has had applied to it in prescribed circumstances a prescribed process designed to prevent the transmission of serious mitochondrial disease’ (Human Fertilisation and Embryology Act 2008)

The overall section 3ZA at that time defined ‘permitted’ as those ‘nuclear or mitochondrial DNA has not been altered’. However, 3ZA (5) left room for the Secretary of State to extend the meaning of ‘permitted’ by introducing Regulations to Parliament so that the Act could allow those treated in specific ways as specified in the Regulations to avoid the transmission of mitochondrial diseases. The commentary on the section expected the technology to be established, and its safety would concern the decision on permission:

> ‘In the future, it may be possible to create embryos using an affected woman’s egg, her partner’s sperm and healthy donated mitochondria. This regulation-making power will enable such embryos and eggs to be implanted in a woman if the technology became available and was proven safe’ (Explanatory Notes, Human Fertilisation and Embryology Act 2008)

While this change in law was significant, the policy debates on it were not intensive, partly because the amendment had another motivation, which attracted more people’s attention:

> ‘In one sense, that was almost in my mind⋯ that was the crucial moment because that was when it was recognised that this was a prospective technology, and the power to enable it to take place was written into the law, albeit one has to be, you know, given effect through a further parliamentary process. But actually, the fact that it was the first place, creates a certain kind of momentum, as you can understand. And my… You know, kind of reflecting back on that I mean, I think, in many ways. *whilst most mitochondrial donation was clearly a significant development and one that raises distinctive issues for a lot of people, a lot of the debate in 2008 was focused elsewhere*. A lot of it at the time was focused on human admixed embryos, which was the real sort of novelty that was provided for in the act, and something that there was a lot of, you know.’ (Interviewee 11, former official, emphasis added)

However, the interviewee suggested that once the law was amended, there could have been an atmosphere that assumed social and ethical issues had already been discussed and resolved.

> 'I guess what's interesting about now is that *when people actually got around to thinking about the reality of implementing it, actually, a sort of moral debate and all the sort of social and ethical debate had already gone past, and by that, it's just become a kind of technical, you know, waiting for the science to be.* In some ways, that's if you look at what is often said about how, you know, public reflection lags behind scientific development. In some ways, this was a good example of that happening the other way around. But. on the other hand, if you take what I say about how those regulations got kind of slipped in without too much attention in the first place. then actually what one could say is that they didn't take place in the way that one might have wanted them to. And also I mean, it seems so when it, what was never debated, and this is my main, perhaps a criticism of the process.' (Interviewee 11, former official)

In other words, the separation of science from social and ethical issues had already taken place in 2008, and on each occasion, they shut their eyes to social and ethical issues. This could recall the dilemma in social control of technology articulated in the previous study (Collingridge, 1980).

Scripted Engagement

It should be noted, however, that the separation of science from any other issues did not merely mean that the social or ethical issues were entirely dismissed or ignored during the phase. One year after the first scientific review was published, the Secretary of State for Health asked the HFEA to seek public views on the technology to review such issues:

> 'The Human Fertilisation and Embryology Authority (HFEA) has been asked to lead a public discussion to ask if a new scientific procedure, which could prevent women with mitochondrial disease from passing the illness to their children, should be introduced.[…] The purpose of the public dialogue is to review the ethical, social and regulatory issues involved if mitochondrial transfer is to be permitted for use in clinical treatment, and to contribute to HFEA's advice to the Secretary of State for Health' (Press release of the Department of Health, 19 January 2012, archived on 21 February 2013)

There was a clear distinction between technical and social issues regarding the technology created in this context. Indeed, the resulting advice was annexed by independent public dialogue reports and updated scientific review by the re-organised Panel. They made a clear division of labour between ethical issues and scientific facts, which previous advisory boards commonly created.

One year after the first inquiry, on 19 January 2012, the Secretary of State for Health asked the HFEA to 'seek public views on emerging IVF techniques designed to prevent the transmission of mitochondrial diseases'[24], in association with the Secretary of State for Business, Innovation and Skills, who support the UK national public dialogue programme Sciencewise via funding support by UK Research and Innovation (UKRI). Sciencewise was in charge of public dialogue in policymaking involving science and technology issues. In response to this, the HFEA, together with the Sciencewise Expert Resource Centre, commissioned the Office for Public Management (in partnership with Foster and Dialogue by Design) to plan and conduct a public dialogue project to gather public opinions. This half-year project comprised five separate activities: deliberative public workshops, public representative surveys, open consultation meetings, patient focus groups, and open consultation questionnaires.

These activities were considerably organised, but this rigidity could suggest another feature of the policy discourse in this country.

Involvement That Follows the Procedure

During the deliberation, we could observe a commitment to protocol. In each report, the HFEA devoted a substantial portion of pages to outlinining the methodologies employed in each engagement activity as well as review

[24] Department of Health. (2012). *Press release: Government to seek public views on changing the law to find cures for inherited diseases*.

processes. Furthermore, in addition to the pre-set procedures, the policy institutions also introduced an audit system for engagement activities. In running a public dialogue programme, the HFEA launched the Oversight Group, which consisted of individuals with different backgrounds and perspectives, including those who opposed the legalisation of the technology. When questioned regarding the purpose of instituting the Oversight Group, the HFEA staff provided the following explanation:

> 'The other exercise is a sort of broader exercise about public attitudes and the like. That's a much broader question. And it seemed to us right and proper there to have a range of people and not just people who were possibly supportive of these treatments, but actually, people who might be concerned about them. And also, and the oversight panel, *what the oversight panels there to do is to look at questions of process*.' (Interviewee 2, HFEA staff, emphasis added)

Apart from scientific understanding, the attitudes toward the technology were recognised by the HFEA as potentially diverse. Therefore, they worried that the process of public engagement might be criticised for being biased in favour of either for- or against- standpoints; thus, they assigned the scrutiny of the procedure or contents of the public dialogue to the Oversight Group:

> 'So we were structuring the public debate in such a way that would be fair that *we weren't somehow biasing certain voices above others*, that we were listening to all, that we were engaging people in ways that they might have actually understood the information.' (Interviewee 2, HFEA staff, emphasis added)

However, the scrutiny did not target the conclusions of the engagement activities; instead, the Oversight Group examined the procedures and materials so that they could secure *diverse input* into policy deliberation.

While accepting different views, they regarded science differently as a matter of the level of knowledge; thus, they were concerned about whether the participants would obtain technical competence, not regarding it as a matter of views:

> '*Because one of the biggest problems we faced was actually when you talk to members of the public about something quite technical, you can't presume they have the technical*

> *understanding.* So, you know, how do you write the material? how do you provide, you know, text that will enable non-specialists to understand enough to be able then to give informed views and people like the oversight panel becomes a way of helping us do that?' (Interviewee 2, HFEA staff, emphasis added)

Consequently, some of the scientists and clinicians who belonged to the Panel also joined the Oversight Group to check the technical explanation. In addition, while they asked the Oversight Group if they were conducting the public dialogue in a proper procedure, it was literally an 'oversight', so they were not directly engaged in consideration of the procedures or creating the materials.

Importantly, the notion of involvement of diverse perspectives was also embedded in the HFE Act. Paragraph 4 of Schedule 1 to the HFE Act 1990 provided both the minimum and maximum proportions of those with specific professional expertise in Authority membership so that the deliberation in the Authority could be balanced:

> (3) The following persons are disqualified for being appointed as chairman or deputy chairman of the Authority—
> (a)any person who is, or has been, a medical practitioner registered under the Medical Act 1983 (whether fully, provisionally or with limited registration), or under any repealed enactment from which a provision of that Act is derived,
> (b)any person who is, or has been, concerned with keeping or using gametes or embryos outside the body, and
> (c)any person who is, or has been, directly concerned with commissioning or funding any research involving such keeping or use, or who has actively participated in any decision to do so.
>
> (4) The Secretary of State shall secure that *at least one-third but fewer than half of the other members of the Authority fall within sub-paragraph (3) (a), (b) or (c) above, and that at least one member falls within each of paragraphs (a) and (b)*[25].

The pursuit of diversified input and involvement was not carried out on an ad hoc basis but rather introduced by structurally organised procedures.

[25] https://www.legislation.gov.uk/ukpga/1990/37/schedule/1/1991-02-01

Engagement for British Fairness and Integrity

The interviews with the policy actors around the case suggest that these activities for securing the procedures could be crucial in legitimating the conclusive decisions in the country. When an HFEA staff explained how and why they carefully constructed the process of engagement, they mentioned the process's contribution to the legitimacy of the decisions:

> (Interviewer)
> Were you focusing on the process and fairness or transparency?
>
> (Interviewee)
> Yes. I think that's the... because if the process isn't seen to be fair, then the decision often lacks legitimacy. Whereas if the process is fair, even if people don't like the decision, fair-minded people will accept that it was arrived at in a reasonable way. (Interviewee 2, HFEA staff)

It was not only claimed by those who provided the framework and procedure but also agreed upon by those under the framework. In the interview with the representative of a religious group that was against the legalisation, they certainly admitted that they were not excluded in the process of policy deliberation:

> (Interviewer)
> I was really curious how the against opinions were treated in the process of (deliberation)…
>
> (Interviewee)
> Well, I suppose *it was a sort of… sense of British fair play*. You know, everybody's entitled to their opinions, so to speak. [...] I think they respected our opinions, but I don't think much notice was taken of them. I, you know, I would say in general, I think the scientific imperative always, you know, goes ahead. I don't think you can impact significantly, but it doesn't mean that you shouldn't open your mouth.
> (Interviewee 6, religious group representative, emphasis added)

Admittedly, they were not satisfied with the final policy decision of approval of embryonic MRT in humans. However, they clearly acknowledged that the engagement activities and policy discourses that were fair and legitimate in terms of process.

In the policy discourse, the campaigners also organised some engagement activities. Public Education Trust, a charitable organisation siding with those who suffer from infertility could be a particular example, while they clearly supported the legalisation in the discourse. They organised public events inviting those who were against the legalisation of the technology. When I asked them about their motivation for engaging people who might risk troubling the direction of their campaign, they nevertheless stressed the importance of involvement beyond the risk:

(Interviewee X)
Before we get to mitochondrial donation, specifically, we try to do this with everything. So if you read Bio News, we publish articles by people who oppose our campaigning, people we disagree with because we think it's important, because it shows that we are honest, it shows that we trust people to listen to arguments from both sides. It's kind of our philosophy. So yes, with mitochondrial donation we did hold an event with people for and against and we held it in Parliament, Interestingly. We brought the public into Parliament to have the event the day before people in Parliament had their own debate. But yes, that's our general philosophy. It's not just mitochondrial donation, we try to do that with everything.

(Interviewee Y)
Because if people, if people don't hear both sides of the argument, how are they supposed to make their own decision on it? And whether they're members of Parliament or members of the public or the people that stand to possibly gain from this, because just the people who may be affected by because they've had children with this doesn't necessarily mean that they will support it. You think it's more likely they will, but it's not necessarily the case. Or it might be the case that they support it, but other members of their family, like their parents or something like that, would not. And so by having people able to access different arguments about it, they can then draw their own conclusions.[...]

(Interviewer)
I see. Interesting. At first, I thought there could be some risk that people who attended your event could finally be against your side. So it can be a kind of risk…

(Interviewe X)
You have to take that risk. If you don't take that risk, then your arguments aren't very good.

(Interviewee Y)
Exactly. Yeah.

(Interviewer)
Your 'good' means legitimate or kind of thing...

(Interviewee X)
Legitimate, persuasive... I don't want to win arguments behind the scenes, I want the public to be persuaded. Integrity is the word I would use. [...] Not so much fairness. Integrity.
(Interviewees 12 and 13, Trust staff)

They used a different word, 'integrity', but they similarly explained the importance of the process before the people's decision-making. Through these preparatory activities, they tried to provide legitimacy to their arguments.

Unscripted Responses

While the engagement and other policy deliberation activities were argued to be carefully organised, which contributed to securing legitimacy, the actual policy process was more flexible in terms that there were struggles, compromises and activities behind the scenes. These can be seen especially around the Panel after the first scientific review.

In parallel with the public dialogue ordered by the DoH, the HFEA re-organised the Panel with a slightly different membership (Dr Paul De Sousa instead of Professor Keith Campbell and Sir Richard Gardner) and gave successive technical consideration of the technology based on the latest research progress in the field. Combining the result of public dialogue and the updated scientific review conducted independently by the Panel, the HFEA published the 'advisory report to the government' on 28 March 2013. Based on the report, on 28 June 2013, the DoH announced that it would move forward to consult about regulations to allow the techniques for mitochondrial replacement.

Subsequently, the place of drama shifted to Whitehall and Westminster. After the consultation on the draft regulations that ran from 27 February 2014 until 21 May 2014, the draft regulation was laid before

Parliament. It was introduced by the then-Parliamentary Under-Secretary of State for Health, and the debate was a 'free' vote, which means that MPs were free from their party's political intention. On 3 February 2015, the House of Commons voted by a majority of 382 to 128 in favour of the new regulations. Three weeks later, the House of Lords also voted in support of the regulations (a majority of 280 to 48). As a result, the new statute–the Human Fertilisation and Embryology Regulation 2015–came into force in October 2015.

However, the shift to the government and parliamentary debates did not mean the end of the advisory discourses. Alongside the public consultation on the draft regulations, the government again requested the HFEA to conduct a further scientific review of the evidence of safety and efficacy for the two mitochondrial replacement techniques of PNT and MST. The HFEA then re-organised the independent review panel. The membership of the new panel was again slightly different but comprised experts from similar fields (Table 4.1). They called for updated scientific evidence around the field and then published a report before the Parliamentary vote. Moreover, in 2016, following the parliamentary approval, the HFEA reconvened its scientific review panel by themselves to assess the latest evidence.

Table 4.1. Membership of the Panel

Name	1st Review	2nd Review	Oversight Group	3rd Review	4th Review
Professor Neva Haites, University of Aberdeen	○ (co-chair)	○ (chair)	○	-	-
Dr Robin Lovell-Badge, MRC National Institute for Medical Research	○ (co-chair)	○	○	○	○
Professor Peter Braude, Kings College London	○	○	-	○	○
Professor Keith Campbell, University of Nottingham	○	-	-	-	-
Professor Sir Richard Gardner	○	-	-	-	-
Professor Anneke Lucassen, Human Genetics Commission	○	○	-	○	-
Dr Paul De Sousa, University of Edinburgh	-	○	-	○	-
Dr Andy Greenfield, Medical Research Council (MRC), Harwell and HFEA member	-	-	-	○ (chair)	○ (chair)
Professor Frances Flinter, Guy's & St Thomas' NHS Foundation Trust	-	-	-	-	○
Professor Caroline Ogilvie, King's College London and Guy's & St Thomas' NHS Foundation Trust	-	-	-	-	○
Dr Tony Perry, University of Bath	-	-	-	-	○

Struggle in Public Controversies

One significant feature of the consequences of the public dialogue activities was that the policy institutions did not pay as much attention to different views and opinions as they did in preparing such activities. This could be visible in their interpretation of the results of public dialogues.

Actually, the result of public dialogue was not one-sided. As seen in Figure 4.1, there were more positive initial reactions than negative ones toward three different techniques (PGD, germline therapy, and MRT such as MST and PNT), but the proportion of positive attitudes toward MRT were 44% and 56%, which was not the vast majority. Also, in the open consultation questionnaire, slightly more than half of the respondents opposed a change in the law to allow MRT to be made available to those who are at risk of passing on mitochondrial disease to their children.

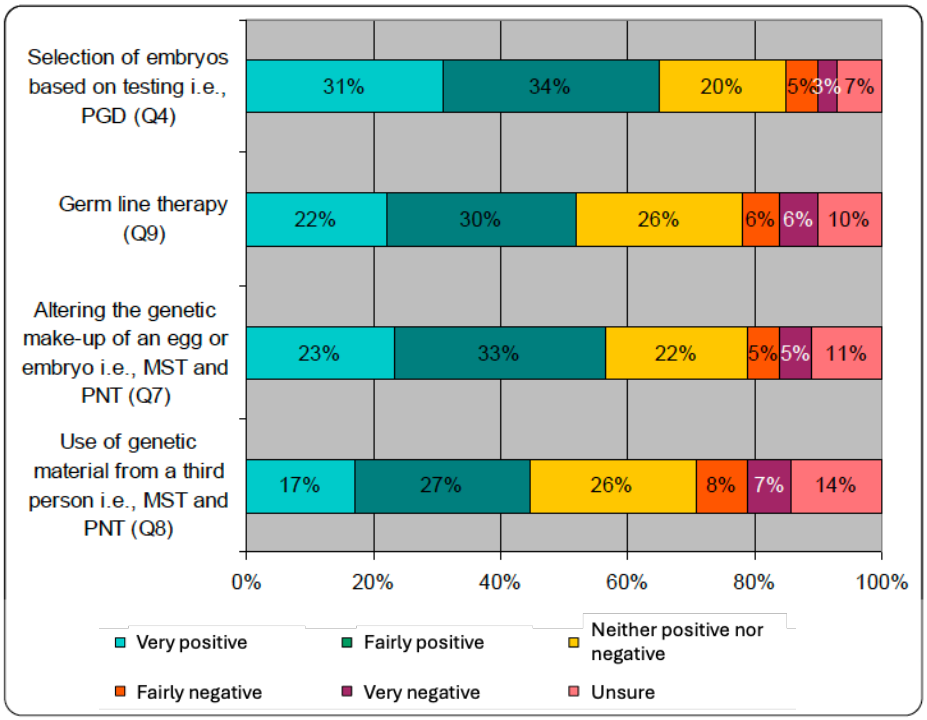

Figure 4.1. Attitudes to the genetic treatment of mitochondrial disease in the public representative survey[26]

In other words, while more than half of the respondents in some questions had a positive attitude toward the technology, a considerable number of people were concerned about its social influences or physical side effects. Also, given the participants cannot be representatives of all citizens of the country, the ratio of opinions does not equal the voice of the whole nation.

However, the public dialogue project report tried to reach in a particular conclusion. There were repeated emphases on the fact that the majority of participants in the event, such as open consultation meetings or deliberative public workshops, had a positive attitude toward utilising the technology for clinical uses. Although they mentioned various comments or opinions around the technology, the conclusions nevertheless stuck to the

[26] Source: Office for Public Management. (2013). *Medical frontiers: Debating mitochondria replacement Annex III: Public representative survey* (modified by author)

majority decision model, obscuring the detailed and diverse views and thoughts on the technology. Despite the considerable number of people expressing concerns about the technology, the resulting report also highlighted the discussion on the importance of individual reproductive choice:

> 'Some participants argued that there is always a degree of uncertainty with respect to medical innovation and that this is "a part of all medical progress" (Participant D). This led the participants to discuss and agree on *the importance of individual choice in deciding whether to use these new techniques*.' (Medical Frontiers: Debating mitochondria replacement: Patient focus group, HFEA, emphasis added)

In this regard, the official at the HFEA interviewed in this study expressed a practical concern about public engagement practices:

> 'These sorts of deliberative events and citizens juries and the like, I think, have real strengths in demonstrating to the people who didn't take part that people like them did take part in that sense. […] I think it gives legitimacy to lead to the outcomes in the process. You know, it clearly is not practical to talk to every adult citizen in the country. That's, you know, it's just not practical.' (Interviewee 2, the HFEA staff)

As policy practitioners, they recognised a practical limitation in inclusion and difficulty in the 'endless search for sufficiently pluralised categories' (Lövbrand et al., 2011). Instead, they argued that the involvement of laypeople in the policy deliberation could evoke empathy with them, allowing those who were not invited to experience the participation virtually and make the result accountable to society.

Compromise in Scientific Controversies

As another unscripted action, we could observe that the scientific arguments provided by the Panel had slightly shifted so that they could compromise with criticisms and other conflicting arguments. Just like most policy discourses, the legalisation of MRT did not go through without objection. The assessment of whether the technology is safe or not inevitably involves an unexplained assumption about how one recognises and is

concerned with the technology, as well as one's viewpoint on safety and the technology; thus, it was not a matter of numerable, science-based probability but rather a value issue concerning how one considers and accepts risk. There was a difference between the threshold for the scientists on the Panel, who were always concerned about technology, and one for the other people, such as other specialists and so-called laypeople who face technology relatively occasionally. However, it could be a bit premature to argue that the policymakers simply dismissed such concerns and recklessly proceeded toward legalisation; the government requested the advisory panel for additional scientific review of the safety before approving the utilisation of technology in clinical practice, concerning the opposition to and the anxiety about the technology.

It should also be noted that even among the scientists, the stance toward concerns had been different. In particular, the concerns about the effect of 'nuclear-mitochondria interaction' were intensively discussed. After the publication of the HFEA's advice to the government and the second review, some researchers with a scientific background, such as sperm biology or evolutionary biology, expressed concerns about the corruption of nuclear-mitochondrial interactions caused by mitochondrial replacement (Reinhardt et al., 2013). The HFEA immediately reacted to the article and explicitly stated that the Panel had already considered the effects submitted to the Panel in response to the call for evidence and concluded that the evidence submitted did not cause concern about the utilisation of the technology, while admitting from a scientistic viewpoint that '[a]s in every area of medicine, moving from research into clinical practice always involves a degree of uncertainty'. More frankly, they did not only consider scientific and technical correctness but also took more conjectural and social reasoning into consideration.

Furthermore, non-technical considerations and compromise can be seen in the subsequent reports, where the experts around the HFEA did not

wholly ignore the negative arguments. In their third and fourth review, the Panel proposed a precautionary approach to avoid concerns about defects in nuclear-mitochondrial interactions:

> 'In addition, *the panel recommends that consideration is given to mtDNA haplogroups matching (see section 3.7.20) as a precautionary step in the process of selecting donors*. This is a complex topic, with some potential risks or benefits associated with choosing a specific donor mtDNA haplotype/haplogroup. At present, the panel believes any risks are very low, but it recommends that if these techniques are used clinically, the latest evidence regarding how mtDNA haplotypes affect nuclear/mitochondrial interactions should be considered in order to inform the donor selection process. The panel also noted that in assessing this risk, the treating clinician should be mindful of the parallels in natural reproduction and current donor processes, such as organ transplantation or sperm and egg donation.' (4th review, HFEA, emphasis added)

An interviewee in this study said that this additional assessment was for those who were concerned about the effect on nuclear-mitochondrial interactions. While the Panel were convinced from the scientific aspect that the risks associated with the mismatch of mitochondrial and nuclear DNA are very low, they made a certain compromise, considering the social concerns about the technology. In this regard, even in terms of scientific controversy, the deliberation at the Panel was not like simplistic arguments from a single scientific standpoint but rather negotiable. This suggests that scientific exchange in the policy arena is not always deterministic and technical as most technocrats argue but, in a sense, quite *social* (although it was too excessive to explain it as *political*, which could evoke Parliamentary discussions or lobbying).

Reflecting on these conflicts and compromises in terms of science, the resulting outcomes in the later report could be different from the attitude seen in the first review. When the Panel published its first report in April 2011, they stressed the significance of the novel techniques of MRT by stressing that the conventional PGD technology 'can only reduce, not eliminate, the risk of transmitting abnormal mitochondrial DNA that may lead to a mitochondrial disease'. Until the second review, they persisted on

their first stance, concluding that 'MST and PNT had the potential to be used for all patients with mtDNA disorders' and that 'these were the only techniques that would make it possible for them to have a genetically related unaffected child', while 'further safety experiments need to be done before introducing them into clinical practice'. On the other hand, the fourth review showed their shift in stance, turning their argument into more cautious:

> 'Research cannot answer every question before a new treatment is offered, nor can it be expected to guarantee safety or efficacy when applied for the first time. *It can only serve to reduce the risk; in this case of a child being born with symptomatic mitochondrial genetic disease,* but with caveats concerning for whom this type of risk reduction strategy might be suitable and highlighting areas that need close attention. *Patients must understand and accept the potential limitations of any proposed treatment, and possible risks, before proceeding.* With this in mind, the panel recommends that it is appropriate to offer mitochondrial donation techniques *as clinical risk reduction treatment for carefully selected patients.*' (4th review, HFEA, emphasis added)

Engagement of Administrators: Materialising Intentions into Processes

While the structure was argued to be organised, there were more activities than written in the methodology. Also, the methodology itself was not given self-evidently but rather carefully arranged by administrators. In this regard, it should be stressed that the stage of the first act of the policy drama on MRT was Whitehall, not Westminster nor Number 10. It began when the researchers of MRT approached the government to make regulations on the technology, which was far before the official discussion at the HFEA. In 2010, the researchers came to the Department of Health and appealed for immediate legalisation, insisting that the technology had been established enough for clinical use:

> 'So Doug Turnbull and his colleagues and Wellcome came back to us ... at the end of 2010. They kind of came back to us, and in retrospect, they were a bit ambitious because what they were saying to us was, "our research is going really, really well, and we will soon have sufficient scientific evidence of the safety and efficacy of using these techniques to be able to achieve in treatment situations."' (Interviewee 9, government staff)

According to the staff, Dr Doug Turnbull at Newcastle University, a leading researcher on the MRT in this country, confidently insisted the Department of Health should consider the legalisation of the MRT. However, the civil servants did not completely sympathise with such advocates; on the contrary, despite their general supportive stance toward innovation, they were sceptical about the researchers' proposal and thought it needed to be subject to close scrutiny:

> 'So we know that it takes quite a bit of time to change legislation. (omitted) [T]hey were saying that in 2010.' (Interviewee 9, government staff)

It was this moment that triggered the organising of a policy debate on MRT. Although they held certain opinions on the technology, they did not directly participate in policy decision-making. Therefore, they began to allocate the necessary efforts and resources for processing the policy discourse. While they were not specialists in the field, they tactically arranged different resources of information or evidence so that they could effectively influence the minister's (and Parliamentarians') decision to be more in favour of their own policy inclination. In this regard, the DoH staff's efforts aimed at persuading the minister and Parliamentarians to support them by making their policy proposal justifiable and providing evidence *in a reasonable way*.

In particular, DoH asked the HFEA to coordinate an expert group to look at the safety and efficacy of the techniques while they were able to organise an advisory panel by themselves. In this regard, DoH was concerned about its own public reputation.

> 'There are certain parts of society in this and parts of the cities, a certain number of parliamentarians, who are ethically opposed to this. You know, they don't think it should happen at all. So that's why it's very attractive to be able to kind of farm these things out to a body that, although it's accountable to Government, is not part of Government. So, the… the HFEA is obviously the hub of expertise around this area. And it has, I think, a high reputation for independence.' (Interviewee 9, government staff)

The DoH staff was aware of how the policy processes they conduct would be recognised by society, especially by those who opposed the techniques. Considering disagreements involving ethical arguments, they thought it was not appropriate to carry on the policy discussion by themselves because this would let opponents think the government carry its own policy inclination through. In this regard, they did not rely only on the HFEA's role as the hub of expertise around embryonic intervention technologies but also on their reputation as independent from the governmental direction. As they admitted, it could be possible to argue that the HFEA can be a part of the government, and indeed, the organisation is sponsored by the DoH. However, the HFEA has a decision-making system that is independent of the DoH, which means that the organisation is not (at least technically) under the control of the government. Therefore, the DoH tried to put deliberation apart from themselves to keep the discussion independent from the government's intention.

As those who received the delegation, the HFEA staff acknowledged the view of the Government:

> 'So I think in an area like this, where the work very considerably is quite a political question, and there were strongly held views on both sides, I think, you know, not only was the HFEA the right expert body to do this. I think the government took the view that it was easier for the HFEA to do it. It would look less like it would look less political if an independent expert body did this review rather than they did it themselves.' (Interviewee 2, HFEA staff)

In the interview, the HFEA staff recognised that both for and against opinions on the MRT included those with a strong belief in the technology, such as religious faith. On the one hand, among the for-group, there were parents with genetic disorders in mitochondria whose children had died of mitochondrial diseases. Such people would be eager to have their genetically related children, which was difficult unless using MRT. On the other hand, some against opinions on the technology came from a religious belief that no one is allowed to intervene in human embryos. The HFEA staff was concerned

about this point and assumed that the government had been worried about reviewing the technology by themselves because such an action would lead them to support one side by policy organisation. Either side they support, it then would evoke political antagonism by those on the opposite side, with criticism that the government had forced their political inclination. Conversely, being independent of the governmental body, they were confident that they could conduct a review process free from political intervention, pursuing scientific examinations.

On the other hand, the government staff also approached the value issues around the technology by themselves. They arranged a meeting between Jane Ellison, the then Parliamentary Under-Secretary of State for Public Health in charge of policy discussion regarding MRT, and the Lily Foundation, a patient group on mitochondrial diseases:

> '[o]bviously, after Jane's experience with the Lily Foundation, she was keen to meet them. And then, after she met them, they agreed to come to the parliamentary briefing sessions so that they could share their experience with parliamentarians as well, which was obviously powerful stuff as well. […] Because, some people's minds will be changed by the science. But, you know, and our minister was an example. Some people's minds will be changed by the human experience.' (Interviewee 9, government staff)

This arrangement of the meeting and briefing sessions at the Parliament successfully shifted the minister's attitude and those of other parliamentarians toward more favour of legalisation. In other words, they guided the direction of policy discourse toward legalisation not by their own explanation but by different information independently provided by scientific advisory bodies under a separate body and people who were concerned about the technology's target diseases.

HFEA staff were also key players in the policy discourse on MRT. As evaluated by the government staff, they were confident about the organisation's potential as an authoritative arm's-length body with skills of rigorous scientific scrutiny. They were proud of being independent of

governmental intention and being able to provide potentially different views from the government. Indeed, its expert panel did not behave and draw a conclusion as the DoH had expected:

> 'I think the original preference was that we would have had an expert panel sign off to say everything was safe before we introduced the legislation. But what happened was the end of the part... at the end of the government's parliamentary time was coming in 2015 […], and *the lead minister at the time and Number 10 were very keen to complete this as part of that legacy*. […] so we came up with this kind of compromise that we know that we recognise that, until the expert panel had cleared the safety and efficacy, *the HFEA as a regulator would not license any treatment requests.*' (Interviewee 9, government staff)

In the face of uncertainty about the techniques, the Panel and the HFEA could not conclude that they were safe enough to be legalised, even though the DoH felt the political pressure from Number 10 wishing the Panel would give the green light to the MRT before the election. Therefore, according to the interviewee, the DoH had to make a sort of compromise to settle the policy debates, which could be compatible with both sides: while the law admitted the techniques to be legalised as a general, it also required the additional evaluation on their safety at the expert panel and the examination process for every single project for clinical use of MRT. In other words, the DoH administrative staff tried to provide a legacy for the then government under the HFEA's objection to the hasty approval of the technology. As a result, it took another two years after the Parliament's approval for the first mitochondrial donation to be officially approved.

In sum, we could argue that the administrators' involvement was significant, even though they tend to be recognised as machinery due to their contribution to the construction of processes of policymaking. At the same time, however, it should also be of note that their involvement was not a pursuit of their inclination that spoiled public engagement and scientific advice. They were still stuck on the plausibleness of the policymaking process.

Plural Society

While most scenes were *legitimately* scripted, the very scripts were influenced by the stealth interventions of scriptwriters. At the same time, however, this does not mean that the policy drama excluded any ad-libs by actors; indeed, there were considerable efforts for compromise on stage and behind the scenes.

Nevertheless, there were also disagreements that had difficulty in finding the middle ground. Also, retrospective consideration could reach a criticism that the very process was inadequate for the purpose. Here, we can see some additional features that could contrast with the case of Japan, which will be analysed in the next chapter.

Openly Admitting the Inadequacy

During the time the dialogue project was conducted, they tried to justify the resulting conclusions by providing procedures in a transparent manner. However, in the interview, the HFEA staff explained their views on the past experience and criticism of the engagement activities:

> (Interviewer)
> Throughout the debate and as well as public dialogues, what kind of your action or commitment did you find worked well? Or if you could have changed anything of your activities at that time, do you have anything to improve the outcome?
>
> (Interviewee)
> *I'm sure if we did it again, we wouldn't just do it the same. And that's not because how we did it was fundamentally wrong. But I think the sort of thinking has moved on. You know, when we did that, it was very much the sort of cutting edge of that sort of public engagement.* And I think these sorts of techniques have moved on quite a bit. And, you know, I think we want to..., you know, I think we want to look at it fresh from now we from If you like, and kind of think, what techniques for engaging with the public are there, you know, and would some work better than others. So I think the work best of all was this sort of encouraging debate among the participants and helping them with expert advice and written information and stuff like that. I think that's really quite a positive way of doing it. (Interviewee 2, the HFEA staff, emphasis added)

They were considerably open to the current criticisms, but it does not mean that they accepted such arguments retroactively. They considered that the process was constructed to the best of their ability at that time, and the process itself should be subject to ongoing improvement. In other words, this acceptance of imperfection suggests that their attention regarding legitimacy was mostly focused on the input phase, leaving the results less addressed.

Strong Objections and Giving Up Consensus

The policy actors also had some recognition of conflict and disagreement, which was another motivation for them to give some compromise in their policy discourse.

However, it might be worth noting that the opponents focused more on their own opinions rather than paying attention to the others:

> 'There's no stopping science. We must go ahead. We must go ahead. But I think it would do us a lot of good to have a lot more information about how a lot of... how the IVF, etc., how it all started, which I said yesterday, we don't know. It's all blank about what they were doing, you know, embryos being put in other animals, human embryos in other animals. We don't know any of that. *And at the time, some of those things should have stopped the process anyway. It should have been said, " No, no, no, this is not right. This is not right"*. I mean, even in terms of using animals in, in our culture, you don't have intercourse with animals. It's still a no-no. It's still forbidden. […] So I don't think I'll ever understand why the United Kingdom rushed ahead and allowed so many what... a sort of mess. To my mind, rules, so many, got broken so quickly. I have no idea what it was.' (Interviewee 6, religious group representative)

Compared to the supporters, such arguments did not allow space for other opinions to be argued. In this regard, the patient groups also recognised the critics' view:

> 'So church groups, Catholic groups and pro-life groups who didn't believe in... Now, I think all you can do is tell your story and tell..., you know, and give your opinion. But ultimately, a belief is a belief. It's not my job to turn somebody's belief, change his belief and never felt like I had to or... Everybody's entitled to, to their..., to their belief. It can be frustrating sometimes when you're sitting there, and somebody tells "well, I disagree with this. I think

> it's terrible that we do this", and then start to talk about his full, healthy children and what a wonderful life they have and how his four kids of this one doing that. And one doing that... "I know, you're very lucky. Then you got four healthy children, but I'm not". You know, that's just a frustration. But, you know, it's everyone's entitled to their beliefs. And it was never a job or opinion in a job of ours to change that.' (Interviewee 7, patient group representative)

They acknowledged the different opinions but resignedly admitted that they could not find a space for negotiation, mentioning the opinions as 'their belief'.

Scientists around the Panel, as well as administrative staff, also understood that there were oppositions to the legalisation and did not refuse such opinions but rather thought these incompatible stances could coexist in society:

> *'And it's important to acknowledge that for some people, this approach is never going to be acceptable.* But what's interesting about the view of members of the public, is that they can often be quite sophisticated and nuanced. So people may say, "Well, I wouldn't want to try this risky approach myself, but I accept that for other people, this may be an approach that would be helpful to them". And I think that's a very mature approach to things.'
> (Interviewee 1, medical scientist, emphasis added)

There is always uncertainty regarding emerging technology, and the assessment of whether the technology is safe to use inevitably involves a value judgement. However, the mention of patients' individual choices could foster the notion of individual rights, which could, in turn, distance, if not disconnect, the technology's issues from social concerns, limiting the issues at stake to only patients and their families.

The special attention to patients can be seen in the interview with a medical scientist who has plenty of experience with patient couples. In particular, the interviewee explained the patients' ability and right to make decisions on their own:

> 'We don't believe in this country anyway that it's up to us as clinicians or up to the government to say what couples should do. *There's a concept called autonomy: patient autonomy and reproductive autonomy.* We believe it's up to the individual couples to decide

> what is right for them (within the constraints of what is legal).' (Interviewee 1, medical scientist, emphasis added)

Their final argument for legitimisation was to put the issue as a matter of patients' free choice. In other words, the proponents of legalisation separated the whole society and limited the issue to patients and their families, and this plurality of society provided legitimacy for the arguments because it gave them a sort of a valid range.

4.3. Imagined Publics and the Legitimacy Around Them

Separation in the Publics

Just as real publics have different characteristics, the Imagined Publics could also have diverse characters from the viewpoint of officials and scientific advisors. In the case of the MRT deliberation in the UK, we could find two distinct Imagined Publics: one as the beneficiaries of the policy and technology who co-create science and policy, and the other as evaluators who have opinions toward the trajectory of science and direction of policy.

The separation between patients and others could be typically materialised in the public engagement exercise during the policymaking practice, which I will address more in detail later. During the exercise, the patients and the other ordinary participants were completely distinguished. The Office for Public Management, the organisation commissioned by the HFEA, organised deliberative public workshops and patient focus group meetings in a mutually exclusive manner[27]. Participants in the workshop could watch a video of a patient talking about the experience of having mitochondrial disease as a support for their discussion, but there was no interaction between patients and participants. In other words, the design of

[27] Sciencewise (2017) "Mitochondria Replacement" [ONLINE] Available at: https://webarchive.nationalarchives.gov.uk/20170110132751/http://www.sciencewise-erc.org.uk/cms/mitochondria-replacement/

the dialogue project itself manifested the separation of the publics into two distinct groups.

It should be noted that the imaginary of the public itself is not a brand-new concept but has long attracted the interest of scholarship. In social studies of science and technology, in particular, there has been a notion that knowledge products or technical products 'construct the user' by shaping themselves around basal presumptions about the user situation, the public and relevant social worlds (Wynne, 1993). Referring to this, scholars have argued that scientists or technologies construct their particular public, which is embedded in their knowledge production or products (Stilgoe, 2007).

State administrators or other science-policy actors could construct generalised imaginations of the public. Maranta and his colleagues (2003) noted that such imaginaries are different from the 'representative' type of imagined lay persons in their term, which associates a particular knowledge production or participatory process and clearly represent particular groups of people in the real society. They argue that because civil servants must consider the laypeople in very general terms and are less able to receive the will of people in a self-defined language, the civil servants' imagination about the publics tends to be reduced to the possible simple reactions that make sense for them, such as agree or disagree.

The Imagined Publics elucidated in the case analysis of the MRT policy discourse could support or even enable us to dig more deeply into such notions in the previous studies of institutional construction of the imaginary about the publics in STS literature.

Patients at the Centre of the Imagined Publics

Throughout the debates, we could see repeated mentions that the techniques of MST and PNT were for patients with mitochondrial diseases. However, in terms of medical methods, these techniques modify the genetic

material in babies to be born, not the patients themselves. Also, the potential users are not limited to patients but include those without diseases. Thus, this rhetoric narrows down the target of the technology compared to the potential users. In this regard, I would argue that these expressions embrace their Imagined Publics, of which the patients are located at the centre. This could have created a sort of empathy for patients and then provided an ethical legitimisation for the arguments for the policy intending to rescue patients (i.e., most of their Imagined Publics) who were eager to have their genetically related children free from mitochondrial diseases.

There could be several factors behind the construction of the Imagined Publics. First of all, the professional ethics of medical specialists could have contributed to the construction. In principle, medical professionals have a professional obligation of beneficence, which requires them to act in the best interest of their patients (Boyd, 2005). Moreover, over the last four decades, the trend has shifted toward patient autonomy, and now clinical specialists are required to pay more attention to patients' individual choices (Moulton & King, 2010). This is not to criticise clinicians or any specialists in the medical field, but their sympathy with patients could influence policy direction. Second, these Imagined Publics embrace the understanding of science as a solution to problems, so these imaginaries must have been constructed in association with the sociotechnical imaginaries of 'science to the rescue' among the policy elites in the UK (Smallman, 2018).

However, this rhetorical focus on patients could split policy players' Imagined Publics into those suffering and in need of new technology, and others concerned about its social influence while paying more attention to the former as the beneficiary of the technology and policy. Their normative attitude was constructed on their Imagined Publics as *those suffering who need the technology* did not allow them to ban the technology. Their inclination was toward legalisation, although they provided several reservations considering those who opposed the technology. This division of

the Imagined Publics could have common perspectives with 'the social construction of target populations' in the study of Schneider and Ingram (1993). Patients of mitochondrial diseases were framed as the target population of policy design, who receive the benefit of the legalisation of mitochondrial donation. Therefore, such an imaginary is relatively specific and substantive.

The Imagined Publics as *those suffering who need new technology* could also share the key concept with the notion of the 'representative type of imagined lay persons' in the study of Maranta and his colleagues (2003). In particular, experts who develop scientific knowledge tend to create particular imaginary of the public with stabilised loyalty to science or experts. Thus, such imaginary could be instrumental, especially when they try to gain support for their policy proposal in the process of public dialogue.

At the same time, the Imagined Publics as *those suffering who need the technology* could have evoked another response from policy players. The case showed that policy players listened more attentively to patients and their families in the real world, either directly or through public dialogue programme. Since such types of laypeople became much closer to the centre of the policy arena, they went beyond just *the beneficiaries of the policy* and could become more like stakeholders. Being on the same page with the government and surrounding policy actors, they could actively get involved in policy deliberations as *colleagues in policymaking*.

Imagined Publics as Evaluators

With regards to the response to and interpretation of the public dialogues, we could see a different character in the government's Imagined Publics. I would name this another face of the Imagined Publics as *evaluators*, and I argue that it has two features relating to the policy decision-making in MRT deliberation. First, there was a simplification regarding their response toward using the MRT technology, forming the Imagined Publics as those who

assess the policy decision-making. From the beginning, the concern of the policy actors over the publics was whether they would support the legalisation or not. True, the purpose of public dialogues was to 'seek the public views' on the technology, which did not restrict their search to a dichotomy between ayes and noes. However, the final report of the public dialogue project emphasised whether the majority of the participants supported or opposed the legalisation. Second, there was a clear difference between these evaluators and the patient groups in terms of their commitment to MRT policymaking. While the government regarded the patient groups as *colleagues* of policymaking, akin to scientific advisors, they placed the rest of the publics *apart* from the inner circle.

Let me dig deeper into these characteristics of the Imagined Publics as evaluators. The simplified imaginary about the publics in the MRT discourse could lead to the separation of the publics, except patient groups, from the central arena of policy deliberation on the technology. While different experts were involved in the process of negotiation and compromise, the publics were not recognised as members of such collaborative works. Such a relationship resembles citizen's juries in this country, which deliver a verdict on the guilt or innocence of the defendant in criminal trials[28] but whose deliberation is separated from the consideration of the direction of the trial and questions of law, conducted by professional judges[29]. This is inconsistent with the notion of co-production, in which the publics are actively involved in the process of construction of science and the surrounding social orders. This separation of decision-making could risk oversimplifying detailed or diverse concerns and opinions, thereby limiting the chance of interaction among each group.

However, it is not wise to simply criticise this simplification as ignoring the publics. In the interview, the official expressed practical concerns about

[28] https://uk.practicallaw.thomsonreuters.com/5-636-2498?transitionType=Default&contextData=(sc.Default)&firstPage=true
[29] https://www.nidirect.gov.uk/articles/what-happens-jury-trial

the procedures. Throughout the debates, we could see a clear distinction between 'science' and 'others'. On the other hand, this division was not equal to the 'deficit model' of public understanding of science. Rather, science was separated from any other expertises, being established as *free from values*. In this regard, it seems difficult to blame them for finally standing by legalisation. In the process of policymaking, the government needs to reach a particular conclusion at some point. To articulate the different opinions and leave them where they are was not enough for them. While the Parliamentary vote would make the inclusive decision-making, different opinions were condensed and summarised beforehand to reach a single (or a limited range of) conclusion. Thus, the officials needed to condense them into a limited number of, if not a single, essences in final decision-making.

In this regard, we could argue that this type of Imagined Publics could have a common notion with the 'generalized type of imagined lay persons' as described by Maranta and his colleagues (2003). The imaginary produced by civil servants is not simply a product of epistemic asymmetry and corresponding authority that experts have. Rather, it could result from the duty of the civil servants who need to control society through regulations and other policies. Therefore, we might need to differentiate such an imaginary from one with a representative aspect, which is constructed around the experts.

Using metaphoric explanations for the interrelationship among actors surrounding the Imagined Publics in MRT discourse, we could describe them as relations among people surrounding artistic sports such as figure skating, gymnastics, and competitive dance. In this figurative framework, we can articulate the patient groups as well as scientific advisors, and Parliamentarians join the performance teams organised by the civil servants, while other citizens act as judges. While a limited number of persons (i.e., performers) appear on the stage, there are many collaborating staff behind the scenes, with considerable influence on the performance. Nothing about

these sports is done without an eye to the judges, and there is a clear distinction that places judges apart from the arena or stage. In this relationship, performance teams do not stand on the same side as the judges but rather opposite to them, exposed to their evaluation of the performance. Whether the teams like it or not, they are certainly concerned with the preference of the judges but never engage them in the planning or construction of the performance. The relationship between performance teams and judges could be separately hierarchical, if not adversarial, as those teams are under the scrutiny and control of judges. The Imagined Publics as evaluators are akin to this; they were certainly shown respect, but in reality, they were the target whom the core policy actors had to justify their actions, as the publics are actually those who evaluate the policymaking practice.

Procedural Legitimacy

In the analysis, we have observed the pursuit of securing the quality of input for legitimacy. This was particularly visible in the special attention to openness and diverse incorporation in the design of the process of policy discourses. Interestingly, the 'fairness' of the policy process was acknowledged even by those who opposed the legalisation, even though they did not agree with the policy institutions' policy direction. Therefore, we could argue that these notions of legitimacy were not coercively argued by those who construct the policy deliberations but rather permeated widely throughout society. Also, it should be put down here that the legitimation did not necessarily arise only from acceptable results and conclusions; rather, the provided procedure for decision-making can accommodate legitimacy, which is in line with the shared core principle of Western democracy (Goodin, 1992).

Procedural rigidity could also be seen in the scientific review process. The Panel put out a call for evidence on 28 February 2011 to ask for scientific evidence on 'the safety and effectiveness of methods to avoid mitochondria

disease through assisted conception'[30], which was sent directly to more than 30 experts in the field and to 25 professional bodies. In their first recommendation report, they clearly explained these processes and other methodological details, justifying their conclusive recommendation.

These observations could be in line with the arguments raised by Dimond and Stephens' study on the same policy discourse, in which they concluded that the sociotechnical imaginaries of the politics in the country 'as ethically sound and world-leading due to the strength of its science base and permissive but highly scrutinising regulatory regime' (Dimond & Stephens, 2018). They paid attention to the established regulatory framework in drawing the conclusive claim, which shares the same attentiveness to the procedural structure in developing legitimacy, as observed in the thesis's findings regarding the legitimation of the decision-making. In other words, the legitimacy provided by procedural rigidity could be observed beyond the democratic conception.

Using the typology of legitimacy provided by Scharpf, we could argue that the main focus for legitimacy in the policy case was clearly on the input phase. Even though the resulting conclusions could not take the oppositional or cautious opinions into full account, the policymaking process gained some understanding, not just in a self-praise manner by government staff and those who supported legalisation. Contrastingly, the policy actors were relatively open to disagreements and criticism from a particular side after the *legitimate* process, while they nevertheless did not deny the meaning of the process and its conclusions. Also, patients and scientists gave up gaining understanding from the opponents of legalisation, leaving the conflict unsolved. Given these findings, we could argue that their legitimation is not

[30] Haites, N., & Lovell-Badge, R. (2011). Scientific review of the safety and efficacy of methods to avoid mitochondrial disease through assisted conception: Report provided to the Human Fertilisation and Embryology Authority. Retrieved from https://www.hfea.gov.uk/media/2613/scientific-review-of-the-safety-and-efficacy-of-methods-to-avoid-mitochondrial-disease-through-assisted-conception.pdf

provided through retrospective analysis of the results; instead, it could be secured by the procedures that produce the results, no matter what they are.

Actions for Legitimacy: The Notion of Responsibility

As shown in the previous sections, there were clear distinctions between the attitudes of policymaking actors among different Imagined Publics. In this regard, I argue that these contrasts stem from their different types of responsibility for policymaking and accompanied legitimacies in policymaking. Here, I will draw on Pellizzoni's classification of responsibility and Scharpf's grouping of input/output legitimacy, as introduced in the literature review chapter.

First, the Imagined Publics as *those suffering who need the technology* could have evoked mixed responsibilities, both of which were concomitant with the sociotechnical imaginaries of 'science to the rescue'. In processing the policy deliberation at the Panel, the imaginary could have led policy players around the government to feel a moral responsibility to help the patient groups. According to Pellizzoni's classification, this paternalism-like responsibility could be categorised into the *care* type. At the same time, in the public dialogues and the response to their result, central policy players held the *responsible* type of responsibility to the patient groups, by which they actively listened to and had respect for the patient groups' value recognitions and policy preferences.

As claimed by Pellizzoni, both types of responsibility are anticipatory, which means these responsibilities can prescribe the future decision-making for their Imagined Publics. In these responsibilities, there was more stress on the output legitimacy; in other words, they were concerned about what the Imgined Publics wanted. The former, *care* type of responsibility, considered the professional expertise could help to speak for the patients, who could not explain precisely what they really wanted. In this relationship, the responsibility could involve end-related paternalism (Le Grand & New, 2015).

On the other hand, in the latter situation, where the policy actors engage the patient groups as their *colleagues* in policymaking, they were concerned about the thoughts of those engaged.

In contrast, the government's simplified Imagined Publics as *evaluators* and the policy actors' defensive attitudes toward them can be attributed to another character of the government's responsibility to society. They were worried about whether their policy decision would be approved by their Imagined Publics. Or bluntly, they acknowledged that some would disagree with the government's policy direction. Therefore, they had to gain some understanding from them by providing legitimacy other than the acceptable result contents; therefore, they focused on the period before the decision in policymaking. Scrutiny for legitimacy examined how *properly* the decision was made by asking about the trajectory leading to the decision. In Pellizzoni's terminology, we could argue that the *evaluator*-like Imagined Public has fostered or been fostered by the *accountability* dimension of responsibility, in which the government has to demonstrate that the decision was made through a proper process with appropriate grounds. This aspect of responsibility could also align with a key point in Western systems of public administration, in which state administrative organisations are required to secure answerability and transparency in order to secure political and managerial control in both political and administrative domains (Gregory, 2017). In this hierarchical relationship with the Imagined Publics as *evaluators*, the policy actors around the decision-making entity need to pay more attention to whether they can persuade the concerned people by justifying their policy decisions.

Therefore, beyond criticising it as arrogant neglect of the publics, we could give a different explanation of the governmental policy actors' conclusions of the public dialogue process or other engagement activities. They conducted such activities based on the notion of accountability-type responsibility, so their main aim was to secure their own process of decision-

making. It was not active communication with the people to explore what they thought or how they recognised, but rather a justification to secure the final conclusions, which could explain why practical efficacy did matter beyond the rich observation when they simplified their recognitions of the people's response into yes/no questions. Of course, it should be noted that, as previously discussed (Gregory, 2017), these pursuits of answerability do not sufficiently fulfil the legitimacy of the policy.

4.4. Chapter Postscript: The Compromise Behind Fairness

In this chapter, we have investigated the Imagined Publics in the policy deliberation on the legalisation of mitochondrial replacement techniques. In particular, the separation of the imaginary between *those suffering who need the technology* and *evaluators* was highlighted in various activities of policymaking and behaviours. However, this separation was not unique to the Imagined Publics, but rather widely permeated the whole policy deliberation, not to mention one between science and anything else.

Behind the separation of the Imagined Publics, we could illustrate the persistence of procedures and pre-setting protocols in the policy discourse. Each activity was carefully arranged, and these rigid procedures and rules could have worked to foster the separation of each activity and the actors involved in each. At the same time, the rigidness and plausibility could contribute to justifying the whole process, and the arguments or conclusive decisions could be understood if not agreed upon.

As you would expect, however, society is not a single-colour picture. There were certainly ad-lib compromises, particularly in the scientific recommendations and shifting their arguments from the only choice for solving the problem to the choice of risk reduction. These activities were not so much organised as the process to reach the first consideration. We should consider this unwritten process.

The membership of the Expert Panel itself can represent a sense of compromise. By choosing experts from various scientific fields, the HFEA tried to introduce diverse aspects into the deliberation, which they regarded as fair. On the other hand, the Panel members recognised another feature of themselves. In the interview, an expert expressed his contribution to the Panel, which was more than just his scientific expertise.

> 'I was probably chosen because I was a member of the HFEA, and I think the HFEA realised that I could communicate with them. I mean, I think it was important they had somebody who could speak their language. And obviously, I speak the language of the HFEA as well as speak the language of science. And I think that was quite useful.' (Interviewee 3, scientific expert)

According to them, advisors were not just mouthpieces for the government or the HFEA. They recognised themselves as translators or coordinators who bring scientific evidence into the policy arena in a way that those who do not have expertise can easily understand. The advisors tried to get on the same page with the civil servants, but it did not mean they acted as the government or the HFEA wanted. In other words, they recognised that they could stand on the boundary between science and society. Their contributions could share some common ground with boundary organisations (Guston, 2001; Kennedy, 2018), but his comments suggest that such roles could attribute more to the individual capacity rather than the official requirement for the Panel.

These attitudes of advisors contrast with ones of opponents, such as anti-legalisation campaigners or religious group representatives. They also have specific backgrounds that are different from people on the street, but they held relatively fixed views on governmental organisations or other policy actors, which were either hostile or similar to the deficit model of understanding science:

> 'I mean, the Department of Health, as part of the national government, will always tend to have a bias in favour of British science, you know, because part of national prestige. You know, and of course, the possible benefits to British industry. All of these new technologies

> will tend to be really important considerations for the Department of Health..., you know, on top of the general bias they will have in favour of science and technology. Parliament really is, on the science issues, will very rarely force the government to, you know. Not to do anything, not to do what it wants to do. The government is in control on science issues. Parliament will just basically rubber stamp things. In my... that's my experience of the policy debates in the UK over the last 20 years. Yeah, Parliament will not stand out against the government.' (Interviewee 4, anti-legalisation campaigner)

> 'I think, in general, if you stop a group stopped a group of people on the street here, they wouldn't have a clue about any of this. They wouldn't have known what mitochondria mean or what replacement or...' (Interviewee 6, religious group representative)

They drew a clear borderline between the policymaking actors and themselves, putting them clearly opposite sides, while advisors recognised themselves as standing at the boundary between science and policy.

In this regard, we could provide a different explanation for the refusal of the objections to the legalisation. Each argument could embrace negotiable and non-negotiable elements. Given that policies could be illustrated as the product of negotiation. the space for compromise is crucial for consideration in policymaking. There could be more than issue-related conflicts surrounding scientific topics.

Chapter 5: Genome Editing in Japan

The Previous chapter investigated the policy discourse on MRT in the UK. With the purpose of comparing with the case in the UK, I will now dig deep into Japan's policy controversy over genome editing on human embryos. In the same manner as the previous analysis, this chapter aims to articulate how the Imagined Publics, in resonance with the conception of democratic legitimacy, are constructed around Japanese policy discourse on the regulation of human embryonic genome editing. This chapter begins with background information, providing the technical and social context of genome editing and relevant technologies, followed by an overview of the regulatory framework surrounding embryonic intervention on human embryos. Then, I will move into unpicking the policy controversy surrounding the issue, which took place around the advisory committee established in the Cabinet Office. The policy discourse could be seen as a three-act play, each of which with numerous twists and turns.

One reason for the twists and turns, which I will describe later in this chapter, could be attributed to the formalistic introduction of foreign practices and their discord with the local cultural context. Particularly, I will argue that the difference in democratic legitimacy, which could also be seen through the Imagined Publics, could be a crucial factor that caused the confusion and conflicts. Admittedly, as one Expert Panel member criticised and civil servants also recognised, the country's regulatory framework and underlying structure of decision-making are considerably different or even strange from the standard of Western democracy. Nevertheless, we might want to provide an objective anatomy of the social structure before criticising it by comparing it using different cultural measures. Here, this chapter could also serve as an initial endeavour to discern cultural differences while recognising and respecting universal aspects of importance. In other words, this perspective will be of paramount importance in the subsequent chapters, which delve into

the cultural variances in democratic legitimacy and explore potential avenues for public engagement in science policy.

While roughly following the analytical format adopted in Chapter 4, this chapter recognises the importance of ensuring the observed features as cultural facets rather than case-specific characteristics or mere failures due to immaturity. In other words, the findings in the case analysis will need some supplemental data for some sort of generalisation. This could be particularly important when an analysis tries to uncover something new from where there is seemingly nothing different. Therefore, in accordance with the approach described in Chapter 3, this chapter also aims to look into a more general conception of democratic legitimacy through interviews with other science policy actors and documental analysis of daily news coverage. These data will contribute as complementary resources that strengthen my findings in the case analysis.

As seen in the previous chapter on the UK case, science was isolated from other social issues in this country. However, the division in the case of Japan does not show the bipolar division between science and society like the former; even science was a tool for policymaking (especially done by bureaucratic players), which was located above any other intellectual activity. One of the foundations for the hierarchical framework could be a defining characteristic of the 'developmental states'; the civil servants were assigned as the director or conductor of the policy drama rather than nameless stagehands behind the scenes. While the bureaucrats did make a policy decision, they did not decide based on their individual preferences, like elected politicians. They acted as conductors in an orchestra; they exerted some sort of authority in policymaking while they heavily relied on experts' knowledge and opinions, as if a conductor could not play songs without performers. Also, contrary to elected politicians, whose decisions can be democratically legitimised by their political support by citizens, Japanese

civil servants cannot openly justify their decisions, which could even escalate the bureaucrats' reliance on sound (or plausible) science.

5.1. Background

Context 1: Background of the Technology at Stake

It should be noted that the technical background of genome editing and the social debates surrounding the technology held on a global scale should be comprehended. Here, I will provide a quick review of them.

Genome editing – a gamechanger in genetic technology

There are several approaches to conducting genome editing. In the early stage of the history of genome editing, intentional mutation was mainly conducted by using proteins such as zinc finger nucleases (ZFNs) and transcription activator-like effector nucleases (TALENs). ZFNs and TALENs are proteins that contain one molecule that recognises specific DNA sequences and another that cuts the DNA under the guidance of its counterpart. Thus, the function of ZFNs and TALENs is to consciously collapse the targeted gene. However, while seeming theoretically promising, these technologies are costly and time-consuming and have limitations due to the low performance of precise DNA cutting.

Later, game-changing genome editing technology, namely the CRISPR-Cas system[31], emerged in 2012, but this system had a long history before it came into the spotlight (Jinek et al., 2012). Clustered regularly interspaced short palindromic repeats (CRISPR) were initially detected in 1987 in the bacteria genome. Still, the actual function of this sequence had remained unknown for nearly 20 years until when CRISPR was reported to constitute an acquired immunity system in bacteria, protecting cells against

[31] The CRISPR-Cas system is synonymously called the CRISPR-Cas9 system in the context of genome editing. This is because, among Cas family proteins, Cas9 protein is widely used for genome editing technology (for more information, see Ishino, Krupovic and Forterre, 2018)

invading viruses and plasmids in collaboration with CRISPR-associated (Cas) protein (Makarova et al., 2006). In 2012, Jinek et al. (Jinek et al., 2012) reported that the CRISPR-Cas system is capable of cleaving the target DNA *in vitro*, which indicated the usability of this technology in genetic alteration in a similar manner to TALEN or ZFN. Soon after this report, genome editing on murine and human cells using the CRISPR-Cas system was announced for the first time (Cong et al., 2013; P. Mali et al., 2013). Since then, this technology has spread across a wide variety of scientific fields.

The CRISPR-Cas system has brought a breakthrough in genome editing due to its various technical advantages (Mahmoudian-sani et al., 2018; H. X. Zhang et al., 2019). First, since the CRISPR-Cas system utilises RNA, or more precisely, its base-pairing mechanism for recognising target DNA sequence, its specificity and efficiency in target site selection is much higher than other genome editing technologies mentioned above, which depend on much lower specific protein-DNA interaction. Second, the target DNA sequence can be altered by designing the guide sequence of RNA, which is much easier and cheaper than engineering binding proteins that are used in other technologies.

These advantages of simplicity enabled this technology to be widespread at a remarkably higher pace than ever experienced with other technologies (Kawai, 2016). In particular, this technology comes into the spotlight of medical research. The first report on genome editing in human zygotes was published in 2015 (Liang et al., 2015). Three years later, a Chinese researcher, He Jiankui, announced the birth of twin girls with edited genomes (He, 2018; Lucas et al., 2018).

While genome editing is said to be transformative in genomic research and genetic biotechnology, it takes over several technical problems from earlier technologies. Despite considerable improvement, it has not entirely resolved the technical risks argued in previous genetic technologies. Even

though this technology has high target specificity, it still has the potential for off-target effects, leading to unintended and undesirable genetic modifications (Jaganathan et al., 2018; Mahmoudian-sani et al., 2018). Also, while genome editing, as well as other forerunner technologies, provide methods for genetic modification, we have not thoroughly understood the overall function of a genome or the interaction among genes (Goldman & Landweber, 2016). Therefore, technical uncertainty and the risk of unforeseeable consequences do remain around this technology. In this sense, genome editing is not a technology that shows a massive leap from the previous trajectory of this field.

Social debates on genome editing

As described above, while dramatically reducing the possibility of unintended alteration, genome editing still has technical risks and uncertainty regarding the consequences of its implementation in host organisms, indicateing that this technology took technical challenges over from its ancestor technologies. Also, it raises similar technical concerns (even if the degrees are different) as those expressed by experts at the Asilomar Conference.

On the other hand, the advancement of this technology also provokes novel concerns, or manifest ones, that used to be dismissed as unrealistic because of the technical limitations of the technology. For example, while the simplicity of the technology opens the door to whoever wants to use this technology, this easiness can also allow terrorists to create new biological or biochemical weapons. Also, in the medical research area, the high efficiency of genome editing has evoked more realistic concerns about so-called 'designer babies'— infants whose genetic profiles have been altered for particular motivations, such as enhancing of physical and intellectual abilities. Importantly, these concerns are entangled with one's values or social orders, so these are more 'social' issues rather than merely technical ones. Now, these concerns, which could have been neglected during the experts' discussion at

the Asilomar Conference, have become even more realistic and sensible due to the rapid development and advancement of technology. Or, we could simply say that the time has come to pay for the previous negligence.

In these circumstances, diverse groups and organisations in various layers of society are now conducting debates about the possible governance over the technology. Importantly, academia is also actively calling for inclusive debates. The editorial staff of the journal Nature (2015) have called for proactive engagement with the publics. At the international level, In December 2015 and November 2018, the National Academy of Sciences and relevant academic societies in the US, the Academy of Sciences in China and the Royal Society in the UK co-hosted the International Summit on Human Genome Editing in Washington and Hong Kong, respectively[32][33]. Such a voice became even louder after the report of the birth of the genome-edited baby by He Jiankui. Nature (2018) and Science (2018), the two biggest scientific journals, unanimously criticised the indiscreet approach of the researcher and appealed for a global social debate on the issue anew and a worldwide regulatory framework. Also, the academic groups who held the International Summits (excluding the Chinese Academy of Science) organised a New International Commission on Clinical Use of Heritable Human Genome Editing, with participation of academies of sciences and medicine from around the world[34].

In parallel, governmental bodies have also tackled this issue. In December 2018, the World Health Organisation established the Expert Advisory Committee on Developing Global Standards for Governance and Oversight of Human Genome Editing. Alongside these global debates, the governments of each country have attempted to cope with the governance of

[32] https://www.nationalacademies.org/event/12-03-2015/international-summit-on-human-gene-editing
[33] https://www.nationalacademies.org/event/11-27-2018/second-international-summit-on-human-gene-editing
[34] https://royalsociety.org/news-resources/projects/genetic-technologies/international-commission/

the technology. Japan is no exception; the Expert Panel on Bioethics, a subsidiary body of the Council of Science, Technology and Innovation (CSTI), started discussion in June 2015.

Context 2: The theatre and actors of the drama

But what is CSTI? How is the Expert Panel situated in the policymaking practice in Japan? Before examining the case, we need to overview the prehistory of the governance of embryonic study in the country, shedding light on *the place where the drama is performed*. The policy debates regarding regulatory frameworks on human embryonic intervention in Japan, as described in previous studies (Kawakami et al., 2010; Yamazaki & Lee, 2004), originate from the controversies over 'human cloning' and 'human embryonic stem cells (hESCs)'. These polemics, which had put constraints on subsequent deliberations on human embryos in life science research, happened at the end of the twentieth century, long before the sensation about the induced pluripotent stem cells (iPS cells) in this country.

The first report of Dolly the Sheep's birth in February 1997 entirely shook the world. Japan was not the exception to the uproar, and following other countries' response to the announcement, the country's government addressed the regulation of the technique. The Council for Science and Technology (CST) at the Prime Minister's Office established the Bioethics Committee as its subcommittee to discuss the permissibility of applying the clone technique to humans. The subcommittee and its own subsidiary board proposed legal control on using the technique on humans in 1999. Considering the subcommittee's recommendation, the National Diet in Japan passed the Act on Regulation of Human Cloning Techniques, which came into force in 2001.

Almost at the same time, in 1998, a US company announced the successful creation of a human ES cell line. To respond to this other shocking report, the Bioethics Committee then established another subsidiary board in

1999 to focus on research with human embryos, resulting in the recommendation of establishing non-binding governmental guidelines on hESC derivation and its use. The Ministry of Education, Culture, Sports, Science and Technology (MEXT) then set guidelines that instructed all research protocols involving hESCs and so-called 'specified embryos' to undergo two stages of review at the institutional and ministry level.

The administrative reform in the nation's government is also of note. After establishing the law and guidelines, CST was reorganised to the Council for Science, Technology and Policy (CSTP) in 2001 under the Cabinet Office. The new council, chaired by the Prime Minister, includes scientific experts in diverse fields such as science, economy, finance, and communication[35] and concerned ministers. CSTP, later CSTI (Council for Science Technology and Innovation), was assumed to be a high-level advisory council for Japanese national science and innovation policy, established to eliminate the notorious 'vertical administration' tradition prevailing among the nation's government (Figure 5.1). With the attendance of relevant ministers, it was supposed to make decisions on crucial scientific and technological issues in Japan, which may overlap each ministry's jurisdiction. On the other hand, the responsibility for regulation on scientific issues remained under the jurisdiction of each ministry, such as MEXT or the Ministry of Health, Labour and Welfare (MHLW).

[35] The membership of CSTI can be browsed at https://www8.cao.go.jp/cstp/english/policy/members.html

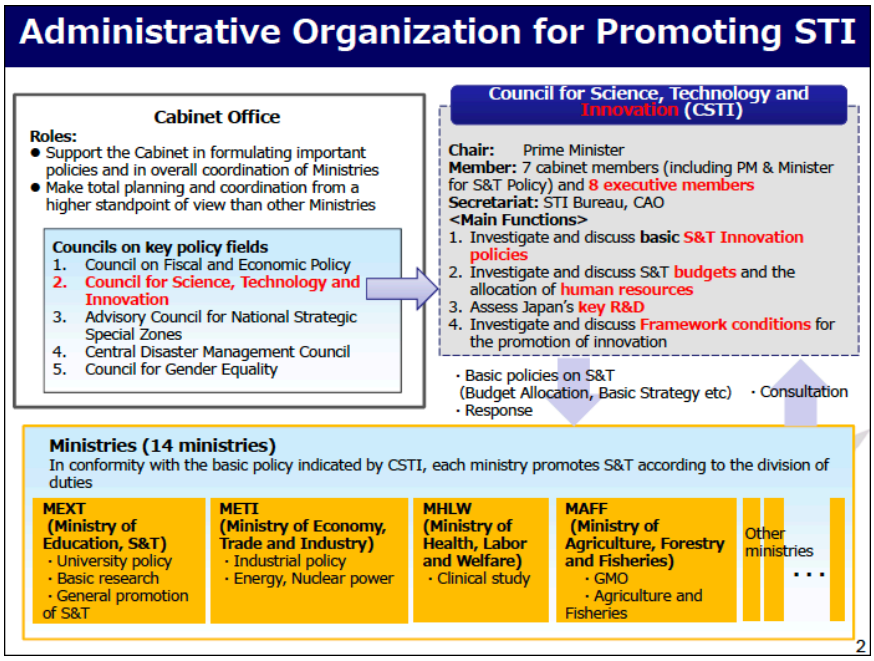

Figure 5.1. The Administrative Organisation of CSTI (quoted from the presentation at the Third APEC Chief Science Advisors and Equivalents Meeting, 2015)

Concomitantly, the Bioethics Committee was also renamed the 'Expert Panel on Bioethics' (hereafter, 'the Panel'). The Panel is responsible for examining ethical concerns in life science and collecting insights from individuals with relevant knowledge and experience for policymaking. It consisted of various experts, including biologists, clinical researchers, jurists, lawyers, ethical researchers, social scientists and journalists.

Before examining the case, it would be worth looking at several features regarding the legal and political status of the CSTI and the Panel. The membership is provided in the Cabinet Office Establishment Act. Article 29 states that members outside the cabinet shall be 'Persons appointed by the Prime Minister from among persons *with outstanding knowledge of science or technology*'. In spite of this scientific expertise-oriented statute, the government has appointed those without a strict science or technological background, such as economists or executives of the country's leading businesses. Regarding the Panel, the rule for the establishment provides the requirements for the members as follows:

> The expert members of the expert panel shall be as follows. At least one member who matches each item 1 to 4 shall be a member.
> (1) Members of the CSTI (Council for Science, Technology and Innovation)
> (2) Experts in academia and other professionals related to the relevant area
> (3) Persons who can express opinions from a general standpoint, including from the perspective of the relevant area
> (4) Persons deemed necessary by the Chairman

Under these limited controls, the government has a considerable range of choices in the knowledge to be incorporated into the Panel. Indeed, while the Panel at the very early stage employed expert members with expertise in human conceptions, such as an expert in religious studies or a novelist, it later inclined to more practical expertise, such as law or bedside medicine, when genome editing was first discussed (Table 5.1).

Table 5.1. Background of expert members of the Panel (except CSTI members)

T1st meeting (6 April 2001)	89th meeting (3 June 2015)
Developmental biologist	Medical Doctor
Jurist	Journalist
Jurist	Developmental Biologist
Medical Doctor	Jurist
Medical Doctor	Jurist
Developmental Biologist	Social scientist
Expert in Religious studies	Biochemist (bioethicist)
Novelist	Journalist
Medical Doctor	Jurist
Jurist (philosopher)	Nurse
Developmental Biologist	Bioethicist
Medical Doctor	Jurist
Jurist	Jurist
Journalist	Health scientist (bioethicist)
Philosopher	Molecular Biologist
	Medical Doctor

In addition, unlike CSTI, the Panel does not involve elected policymakers. Also, the main agendas at the council have primarily focused on promoting of scientific and technological research, such as total budget or basic policy plan. As a result, debates on ethical or social concerns tend to be delegated to these subsidiary expert panels, and then the plenary council just gives their formal approval for the Panel's reports and recommendations.

It is also of note that, as governmental bodies, these committees are all administrated by government officials. Therefore, as seen in the case analysis, most materials, including their conclusive reports or recommendations to the government, tend to be, in fact, provided by such officials. These features regarding the positionings of the Panel and its secretariats could have a crucial influence on the policy trajectory.

Government officials, who serve as the secretariats of the Panel in this context, are largely regarded as administrative elites in this country. Akin to the situation in the UK, the majority of senior civil servants are graduates of the country's prestigious universities, such as Tokyo or Kyoto, particularly from the law department (Shimada-Logie, 2021). They adopt a generalist approach, which includes lifetime employment and a seniority-based promotion system (P. Zulkarnain & Prasojo, 2020).

The collapse of the image of civil servants as 'arrogant but competent and clean', and the consequent bashing of bureaucracy driven by scandals such as subornation, became a driving force of the civil service reform in this country since the 1990s. While they tried to follow the UK Westminster model of centralised personnel management of senior officials under the Cabinet (Estévez-Abe, 2006), aiming at more political (thus democratic) control of civil servants, this emotion-driven movement ended up with politicised administration by flunkies of elected politicians, which led to further scandals (Shimada-Logie, 2021). One important consequence was that despite their fury over bureaucracy, society's demand for elite bureaucracy still exists. The decline of the percentage of Tokyo University graduates among the civil service entrants, which could be favourably interpreted as the diversification of civil service in the UK context, has been widely reported as serious concerns rather than positive effects[36][37].

[36] https://www.fnn.jp/articles/-/200528
[37] https://www.asahi.com/articles/ASRB83S99RB6UTFK025.html

5.2. Case Analysis

Who Makes Legitimate Decisions?

In June 2015, the Panel addressed the policy discourse about ethical issues surrounding genome editing in human embryos. Since the first mention of the technology, the Panel held nine meetings in total before they published the first interim report; four fact-finding meetings in between sessions to discuss the direction of the debate, in which they asked both internal and invited external experts to give presentations; and three meetings to discuss a draft interim report. However, this beginning phase later saw controversy over the responsibility for decision-making on genome editing regulation. Here, I would look into this first phase, mainly focusing on the actors' conception of their roles.

Authority apart from Expertise

The early stage of the discourse saw some overstepping of the expert members. When the issue regarding genome editing was first brought up in the meeting with the introduction of the global trend of the study of the technology, members with a background in ethics or social science continuously argued that immediate action toward the issue was necessary, illustrating the Western (in particular, the United States) trend of quick response.

> [Regarding current issues on genome editing, for instance, there has been a common action of showing a 'quick response' in the Western countries–I mean, they release some statements quite instantly. In this context, the response of Japan is now being watched with interest by the rest of the world, I suppose.] (Member (social scientist), the proceedings of the 85th Expert Panel meeting, 2015)

This sense of urgency, however, then had twisted into an image that the Panel should present Japan's stance on the use of genome editing techniques in human embryos on behalf of the country as if it were their jurisdiction:

> [In US, the government released a clear statement about their stance on genome editing, just as scientific communities did. *Then, in turn, how should Japan react to it? I suppose we are*

asked such a question, so we the Panel would like to discuss what we should do in future.] (Chair, the proceedings of the 90th Expert Panel meeting, 2015, emphasis added)

[We now see growing discussion on this issue around the world. So how to face this… (Omitted) *For participating in the debate, Japan's stance on the technique needs to be clear to some extent.* So, I would like to have a discussion at this meeting to make some provisional statement about our stance.] (Chair, the proceedings of the 95th Expert Panel meeting, 2016, emphasis added)

However, the debates went on without framing the issues at stake. The discussion followed the comments above at the meeting shows that the Panel members did not give consideration to what aspects such institutions reacted to the use of technology. They had no particular inclinations or opinions at that moment. Nor did they discuss issues to be framed in the discussion, or if the technology is socially validated, as well as possible viewpoints or direction of the research on it. In other words, the Panel members were in a hurry just because governments and non-governmental organisations in other countries reacted.

The confusion between ends and means and authoritative self-imaginary could lead to some twists and turns in the following deliberation. As one of such ramifications, some members tried to hold a more technically in-depth discussion on it, criticising the country's regulatory framework for being apart from the global standard. At that time, few areas of embryonic research in the country were covered by the law, and most areas were regulated either by non-binding governmental guidelines or voluntary control among academic societies. One member with a legal background continuously criticised it and advocated replacing these guidelines with legal control, referring to the topics in their speciality and using French terms[38], which are generally unnatural in Japanese conversation:

[I went to France last September to make a presentation on assistant reproduction therapy (ART). When I said that there had not been a regulatory law on ART in Japan, the French

[38] It should be noted that the member's speciality was French jurisprudence, and they had some experience of presentation in France.

> audience exclaimed, saying it was '*incroyable'*. Thanks to such an unbelievable Japanese character of voluntarily obeying non-binding guidelines or rules, we have managed this issue. But strictly speaking, legal authorisation should be required considering the principle of law-governed states.] (Member (jurist), the proceedings of the 96th Expert Panel meeting, 2016, emphasis added)

They attributed the control of ART technology without introducing legal regulations, which had let there be no significant trouble, to 'a characteristic of Japanese people, or their customary behaviour of obeying the government's instructions very straightforwardly'. However, they did not actually appreciate it but instead argued that it was far from the standard they believed to be, based on their expertise. This reliance on their expertise could let them come to possess the self-imaginary of authority.

However, their hurried argument coming from comparison led them to *take action just for taking action*. While they were desperate to take some concrete action on genome editing in human embryos, they did not profoundly discuss why or how this technology socially mattered in the country. Nor did they consider possible concerns regarding values, such as what consequence of the application of the technology can be socially problematic or on what conditions we should place proceeding with the technology over the concerns about it. Their hasty attitude toward action-taking led them to somewhat perfunctory conclusions, leaving these issues unaddressed. Consequently, as the discussion continued, they expressed their hesitation in providing clear-cut standards for judgment all by themselves. At the same time, the Panel did not recklessly decide the stance at their own discretion. This hesitation might have been one of the reasons why it took more than ten months from when the issue was raised, referring to the reactions of other countries to the technology, until the publication of the first interim report as 'a quick response', aiming to keep in step to other countries.

The lack of debates on social issues ended up with a technical explanation on the condition for approval, which the Panel could feel

confident about. Regarding the social validity of using genome editing on human embryos, the report said as follows:

> [Regarding the (a) finding out the roles played by genes at an early stage of embryonic development with the help of genome editing, (b) developing methods to treat congenital intractable diseases and (c) other diseases,] the understanding of genetic interaction at the early developmental stage could enable us to get knowledge on ART or cure for heritable diseases, and the utilisation of human embryos can be the only way for it. In addition to the hope for it, we now know that animal experiments cannot always explain human-genetic interaction. Therefore, we conclude that using human embryos for the above three purposes is socially valid. (…) On the other hand, there are remaining ethical challenges considering that genetic enhancement by embryonic genome editing could be applied for various purposes. Therefore, we cannot conclude that research (d) for other purposes than treatment for diseases could be socially valid.] (Interim Report, P4)

The report concluded that the government should approve genome editing research using human embryos if there is no other option for understanding the mechanism of embryonic development in humans. This was a technical condition for approval but did not involve consideration of societal questions about the technology (although the technology may be prohibited even if there is no other option for the purpose). As a global alliance of academic communities stated[39], such consideration was necessary for 'broad societal consensus about the appropriateness of proposed application'. However, the Interim Report did not follow such statements, while they attentively mentioned them.

In this regard, there could be more than such expertise that gives them such an authoritative self-image. Let me look back into CSTI's contextual position. In the official documents, The Cabinet Office describe CSTI as one of four Important Councils, which works 'as "the place of wisdom" that helps the Cabinet and the Prime Minister'[40]. This notion is consistent with their

[39] The Organizing Committee for the International Summit on Human Gene Editing (2015, December 3) *On Human Gene Editing: International Summit Statement* [News Release]. https://www.nationalacademies.org/news/2015/12/on-human-gene-editing-international-summit-statement

[40] Cabinet Office, https://www.cao.go.jp/en/importantcouncil.html

legal ground, which requires the member to have particular academic expertise. It also resembles the system in other countries, such as the Chief Scientific Advisor in the UK. At the same time, however, CSTI expresses themselves using words such as '司令塔 (control tower or headquarters)'[41] or '各省より一段高い立場 (being a cut above the rest of government ministries and agencies)'[42], which displays an awareness of themselves as a superior, authoritative governmental decision-making body rather than as a scientific advisory council. The chairmanship of the Prime Minister may obscure whether CSTI is a purely advisory board or policymaking authority. Having said that, as can be seen in the proceedings of the meetings, this self-knowledge of authority prevailed even in the subsidiary expert panel, which does not include elected policymakers:

> [The Expert Panel is one of the subsidiary committees of CSTI, which means that *this Panel is the supreme council for bioethical issues in Japan*.] (Chair, the proceedings of the 103rd Expert Panel meeting, 2017, emphasis added)

> […in other countries, these issues are authoritatively discussed by the national-level expert councils on ethical issues, while the names of them differ among states nowadays. Meanwhile, Japan does not have such an equivalent body overlooking the issues in bioethics, although there are several committees authorised to examine individual research projects in the country, as you just said. Now, while seemingly provisional, we are discussing this issue because *this Panel is supposed to have the potential of exerting power to do it*.] (Chair, the proceedings of the 96th Expert Panel meeting, 2016, emphasis added)

> [That is the very responsibility of us or the government staff… Well, I can be a kind of government staff, anyway, so that is *our* responsibility.] (Member (jurist), the proceedings of the 96th Expert Panel meeting, 2016)

The quotes above show that the members of the Panel explicitly described themselves as a part of the government rather than scientific advisors. And their self-recognition as government staff led them to discuss

[41] Ibid, https://www8.cao.go.jp/cstp/panhu/csti2017/p1-2.pdf
[42] Ibid, https://www8.cao.go.jp/cstp/index.html

national policy issues for making decisions, apart from their written task of considering the technical advice to the government.

Notably, the authoritative imaginary of the Panel was not only held by the advisory members themselves. We could see the obedient stance of government staff as secretariat in the early phase, where they used quite honorific expressions and did not explicitly give their opinions. They often used 'ご議論頂く （we would ask you the Panel to discuss)', indicating that the Panel members should play the primary role in the discussion. By contrast, they repeatedly used the term '整理 （sorting)' to explain their actions:

> [In this material, we sorted the ideas that could be helpful for the discussion about the future attitude toward the research on this technology] (The secretariat, the proceedings of the 92nd Expert Panel meeting, 2015)

By using such a verb for automatic actions, the secretariat tried to be neutral and leave all decision-making to the Panel members, even though such 'sorting' could nevertheless entail a particular intention.

Experts' Reluctant Attitude Toward Engagement

The Panel's authoritative self-recognition also influenced the arguments in the meeting. One consequence of the authoritative self-recognition is that they did not actively engage actors outside the policy arena in the deliberation. At that time, several members (bioethicists and social scientists) continuously highlighted the importance of inclusive social debates, which would involve not only academic researchers or stakeholders but also so-called *the general public*. Nevertheless, this notion caused further complications due to the incompatibility with the self-recognition of the Panel.

In the official interim report in 2016, in which they tried to state the country's attitude toward human embryonic genome editing, they referred to the expectation toward the public debate as below:

> [The Expert Panel on Bioethics *hopes* that this interim report, which illustrates the present recognition of, and the result of a discussion on the human embryonic research using genome editing technology, *will arouse the attention of the general public as well as the academic community to the issue*.] (Interim Report, p7, emphasis added)

This mention was seemingly consistent with the previous arguments in STS, which stress the importance of public engagement in science policy-making. However, such formalistic statements were, in a way, hollow inside. The report did not include assumptions about how such policy deliberations outside the Panel would proceed and how policies would be made in association with the deliberations. This lack of framing lets the sentences have little meaning. Also, the Panel just hoped such debates would occur independently, but they kept an apparent distance from those debates. The Panel did not have any channels for interaction with these debates nor showed a vision of how such social discussions would happen. In this regard, the report continued:

> [In particular, the Panel expects that the academic community will actively take the lead in the open debate on the issue, widely incorporating the scientific, ethical and social perspectives.] (Interim Report, p7, emphasis added)

In addition to establishing a governance system, they implicitly requested that academic communities should also gather public opinions for building a regulatory framework. Thus, in the Panel's view, their position was just an independent co-operator who gives a hand to the self-governance of scientific communities.

Even after a year had passed since they released the interim report, they had not taken any concrete measures to encourage public debate, only to repeat that they were aware of the importance of listening to the voice of the public:

> [we don't need just an explanation to so-called the public… or *the society*, but we also need a kind of discussion with them… or dialogue with them. I acknowledge that in parallel with such activity, we must discuss how, or in what condition our society should accept and

introduce such novel technologies.] (Chair, the proceedings of the 103rd Expert Panel meeting, 2017)

It should be carefully examined whether these statements could fit the self-recognition of the Panel as policymakers rather than just scientific advisors, which was previously noted. In retrospect, the self-recognition of authority was somewhat linked with the level of expertise. However, we should not simply acknowledge that these quotes exemplify another technocratic legitimation in policy-making. When faced with very scientific issues, the non-scientist members (especially those who had a legal background) repeatedly commented like below:

> [*What is easy for us, the public, to understand is that…* well, I use 'the public' to mean 'the general public'… Wording aside, *for people like me*, it's simple to see that this technology will turn out to be connected to new treatments for intractable diseases such as genetic medicine. Or prevention could be another option…] (Member, the proceedings of the 97th Expert Panel meeting, 2016, emphasis added)

In discussing the technical matters regarding the technology, the members explicitly identified themselves as 'the public'. However, such comments came out only to contrast with 'scientific experts', focusing on the level of their scientific expertise, indicating more than just a bipolar division between science and others.

After all, the Panel drew a clear border between the publics and themselves. True, they did highlight the deficit of knowledge in the ordinary people. When one member suggested holding a hearing from patient groups or those who were concerned, the Chair showed concerns about their capability:

> [What I think is difficult is… *Even we have just become capable of discussing this issue after getting information through several hearings here. And I'm not sure how much those who belong to relevant patient groups are familiar with this technology or even whether they recognise genome editing itself.* If there are such groups and we have heard about them, we can discuss this issue with them. *But at this stage, I suppose it is rather difficult... I*

agree with your attitude, though.] (Chair, the proceedings of the 92nd Expert Panel meeting, 2015, emphasis added)

At that time, they had only received technical explanations about the technology. Thus, this notion clearly referred to the idea that the technical knowledge of science would matter in this discussion. In contrast with themselves, the Chair of the Panel recognised the people in patient groups, who might not have as much technical knowledge of science as the Panel members had, as less deserving to join the debate. In other words, this document analysis indicates that the self-image of authoritative policymakers could come from expertise but was, at some point, detached from expertise itself. If one became an authority in one field, they tended to regard themselves as having supremacy even in other fields.

Then, why did they hesitate to communicate with the public? We can find a hint from the conversation between the Panel and the representatives of the academic societies, where the Chair of the Panel requested them to gather opinions from ordinary researchers:

> [I suppose that it is academic societies that have direct communication with researchers. As you can see in this meeting, they cannot convey their real voice to us. In this regard, I'd be happy if you [representatives of academic societies] would play a role in picking up their opinions, stance, or even concerns... Sure, I know that they are considering the ethical side as well, but I suppose they must be anxious. I'd be glad if you could also pick up such impressions.] (Chair, the proceedings of the 103rd Panel meeting, 2017)

In this comment, she no longer recognised the Panel as 'the place of wisdom'. Instead, the Panel put apparent distance from scientific communities and behaved like an elite policymaker. In this hierarchical view, the Panel's position vis-à-vis the place of scientific communities could be somewhat above the rest, which can be read from the phrases referring to the hierarchical direction from the bottom to the top, such as '吸い上げる' or '拾い上げる' ('take up X' or 'pick up X', respectively). Also, this comment indicates that ordinary researchers, let alone the public, are too far from the Panel to communicate

with. The Panel expected scientific society to play as an intermediary, bridging the gap between the Panel and players who were placed even lower.

Discord between Academia and Government: Concerns about Responsibility

On the same day when the Panel published the interim report, a joint statement regarding this issue was announced by the Japan Society of Gene and Cell Therapy (JSGCT), the Japan Society of Human Genetics (JSHG), the Japan Society of Obstetrics and Gynaecology (JSOG), and the Japan Society for Reproductive Medicine (JSRM). While their proposal was almost consistent with the Panel's report in terms of the perception of the technology, the societies also jointly suggested the establishment of new '指針 (governmental guidelines)' rather than making voluntary rules by themselves. However, the interim report did not explicitly mention establishing guidelines or who should set them up. Instead, they expected the research communities to consider the ought-to-be regulatory framework:

> [Researchers considering conducting basic research using genome editing on human fertilised embryos are expected to take the purpose of this interim report seriously and conduct basic research for purposes recognised as scientifically rational and socially valid *through the management and careful procedures considered by the research community*.] (Interim Report, p6, emphasis added)

Afterwards, the transfer of the task of rulemaking was furthered. Following the publication of the interim report, the Panel invited representatives of the societies to the next six meetings to discuss the future direction of the governance over genome editing in human embryos, where the representatives proposed cooperation with the government in establishing a regulatory framework. Consequently, the societies organised a joint ethical committee to review individual research projects and began to consider a practical standard for the examination. On the other hand, the Panel suspended further discussion for four months.

The idea of delegation caused antipathy within the scientific communities, who were worried they would have to take full responsibility for the governance of genome editing in human embryos:

> [It might be my personal opinion, but one thing we request is an overall, inclusive guide at the national level. I suppose that either legal regulation or guidelines which are not legally binding could be fine. (Omitted) I don't think we need very detailed rules, *but without any national guide, and suppose we academic societies judged an individual project employing our own criteria, we would be in trouble because the criticisms would target us.* We do not intend to do such an arrogant thing. We just want to develop some concrete, practical standards; therefore, we request that the Panel, as well as the relevant ministries, should establish the general guidelines which provide a foundation for our rules.] (The representative of an academic society, the proceedings of the 103rd. Panel meeting, 2017, emphasis added)

The representative of academic society was concerned about the place of responsibility and argued that academic societies by themselves could not bear the brunt of the criticism by the public, but rather, they thought the government should take it. This response was not what the Chair or other Panel members expected because they hoped that the Panel and the academic communities could collaborate on making policies. Some members tried to deny the irresponsive intentions of the Panel.

> [It seems there are several criticisms, saying that the Panel on Bioethics has left all the work to the relevant academic societies. Therefore, we should assure them that this is not correct. We, the Panel, have spent a considerable amount of time on the discussion on the technology and have tried to establish a better system for regulating it with the collaboration with the related academic societies.] (Member, the proceedings of the 103rd Expert Panel meeting, 2017)

At the same time, however, some members admitted that the secretariat of the Panel could be remiss in communicating with academic communities. As a result, the Chair and some senior officials later actively had a heart-to-heart communication to re-establish a relationship of mutual trust. In this regard, the Japanese government's circulatory personnel system should be worth paying attention to. This custom sometimes assigns senior posts to staff without desirable skills or motivation for the job.

The mistrust led to a scandal in April of the following year, in which the societies announced their dissatisfaction with the Panel and the government. They indicated to the Cabinet Office, the Panel's Secretariat, that they would dissolve the ethical committee. The societies became suspicious of the government's commitment as time passed and had difficulty clarifying where the responsibility lay. In the first Panel meeting after the backlash, the representative of academic societies explained their withdrawal from collaborations:

> [Initially, when we four societies published a joint statement, we had a shared recognition that although basic research should proceed, the government should immediately establish guidelines or something, and we would cooperate with the government. After a while, however, the relationship changed. While we provided some ideas on it, the Panel stayed silent. And this caused some misunderstanding between us. (Omitted) I suppose we cannot make a decision at our own discretion. (Omitted) If we do make a judgement, we eventually need some authorisations or approvals from the government. I remember that we have requested the Panel to let us engage in the establishment of the system.] (Representative of academic society, the proceedings of the 104th Expert Panel meeting, 2017)

The government suddenly became busy getting reconciled with the societies and suppressing the scandal:

> [We would not change the mind that the government will properly further the discussion about the intervention of human embryos *while holding a leadership, guiding position with responsibility*.] (Proceedings of press conference of State Minister Yosuke Tsuruho, 8th Apr 2017, emphasis added)

The comment above, also mentioned by Chief Cabinet Secretary Yoshihide Suga, indicates that the government should responsibly work on establishing the framework, which is different from what we have seen so far in the case. To take responsibility, they no longer had options to delegate the task of building regulatory frameworks.

The Launch of Taskforce: Experimental Engagement

After the backlash, there was a personnel exchange in the staff of the secretariat in this phase, which forwarded the administrative approaches to assist the policy deliberation. As part of this administrative effort, the government established 'The Task Force on a Review of the "Fundamental Idea on the Status of Human Embryos"' (hereafter, 'the TF') as a subsidiary committee under the Panel. The Fundamental Idea on the Status of Human Embryos (hereafter, 'Fundamental Idea'), established in 2004, outlined the government's cardinal attitude toward research and clinical use of human embryos and had been a sort of guideline that had never been changed. The establishment of the TF aimed to soothe the indignation of academic communities onto which the Panel and the government had previously shifted the responsibility for the regulatory framework and social consensus on the issue.

The TF entailed more diverse members, such as academic societies or patient groups' representatives, but half of the members (7 of 14) were from the Panel. They held four fact-finding meetings with guest speakers' presentations and two meetings to discuss a draft report provided by the secretariats. Afterwards, TF released 'the primary interim report' in May 2018, spending half a year on the debate.

However, the report shows a twisted relationship between the TF's aim and its actual output. As the name indicated, the TF's ostensive mission was to review the basic attitude of national science policy toward research on human embryos. More significantly, the membership included those from other sectors: the stakeholders (i.e., representatives of academic communities) and patient groups. There have been several advisory committees that engage stakeholders and so-called laypeople in other policy fields, such as energy issues (Saito, 2021) or pension reform (S. Kim, 2016); however, this was almost the first trial of public engagement in scientific research policy, except for food research (Yamaguchi, 2014). In this regard,

the Chair explained that it was a sort of experimental attempt at engagement that she had proposed. In fact, however, the Chair did not actually hold an initiative in the policy debate. Contrary to the TF's name, the primary report did not propose revising the 'Fundamental Idea'.

Inconsistency in the Name

However, the agenda delegated to the TF was not actually a consideration of the change in the Fundamental Idea as the name or membership embodied, which caused confusion. Rather, the government's initial expectation of the TF was to create non-binding guidelines on the use of genome editing on human embryos based on the existing Fundamental Idea, not to review the fundamental attitude toward embryonic research and revise the report. Instead, it requested that the other ministries establish specific non-binding guidelines for genome editing on human embryos under certain conditions. Indeed, according to the materials that the secretariat provided at the first TF meeting, the expected outcome was 'guidelines' or 'any other regulatory frameworks'. They had already determined the form of output, even before the discussion. In the statement, the TF insisted that using the technique should be allowed only for basic research in assisted reproductive technology (ART) while leaving the door open for future consideration to use genome editing for understanding hereditary diseases and other illnesses such as cancer. However, they did not permit the creation of embryos for genetic intervention research or the transfer of the edited embryo back into human or animal uteruses. Also, they called for public and stakeholder engagement in the process of reviewing individual research projects. Subsequently, MEXT and MHLW launched a joint committee to discuss the regulatory framework. After about half-year deliberation, they established new guidelines for genome editing, which came into force in April 2019.

Lay Members' Interference: More than Expressing Their Own Opinions

Contrary to the civil servants' plan, lay membership within the advisory committee troubled such a pre-determined trajectory of the debate. From the beginning, the lay member raised questions about the remit of the TF:

> [It could be hard for us patient groups to keep up with such a complicated discussion, but I have some questions. According to the document, this task force will discuss the issues delegated by the Expert Panel and ask for the Panel's final decision, right? But I suppose that the Panel has already had a detailed discussion on this issue. […] Also, many, if not most, of the members of this task force are assigned as Panel members and have discussed the same topic at the Panel meeting. *Then, is there any additional agenda for us?* I don't understand the scope of our discussion here, so I'd be happy if someone could explain it.] (Member (patient group), the proceedings of the 3rd Task Force meeting, 2017, emphasis added)

Throughout the debate, they continuously questioned about fundamental premisses shared by the *regular* members of such advisory boards. In this regard, they explained the intentions behind the questions:

> 'If you really want to promote the policy or research, *the first thing you have to do is to inform the public in a language they can understand.*
> Another thing is *that if you want a high-performance car, the brake has to be, too.* It could equip a more complicated engine, and some people could confuse the brake pedal and accelerator. Indeed, when I drive a car, I tend to be overwhelmed by a lot of meters, unknown alarms, and so on. Things are getting very difficult. Ok, if you think about vehicles, there may be various alternative methods. But when it comes to the genome, there are no alternative methods. It has so advanced that we, the general public, would not understand what we are discussing, so what if the discussions just proceeded among experts? Therefore, I make sure to ask questions such as how far it will go, what would happen if a mistake occurred, whether it could be reversed if they made a mistake, what about the children born, what would be the social security system for such children, whether discrimination would occur, and so on.' (Interviewee X7, representative of patient groups, emphasis added)

They tried to pay more attention to the general public, for whom they had some sympathy. In this regard, they did not merely express their own opinions but raised issues that experts would not address:

> ‘They might feel like it’s like that kind of discussion is an amateur discussion. That’s why experts don’t say anything. Of course, they do so themselves, so I think it is my role to tell them that this is not the way to go. I often said, “I don’t understand what you just said. Please explain it to me”.
> I suppose experts probably worried that such comments could cause them some awkwardness. I have experienced many times that researchers and other people came to me after the meeting, saying, “Oh, it was good that you mentioned that kind of opinion”. Someone has to say it. Everyone knows that, but I think there is a tendency to pass over such points implicitly. It is embarrassing to ask such questions or express such opinions at this stage, especially for those with a title, I imagine.’ (Interviewee X7, representative of patient groups)

Adherence to Technical Issues

Panel members, especially legal scholars, also raised questions about the secretariats’ attitude. However, unlike the lay members, their criticism targeted the format: the government’s intention of creating non-binding guidelines as the output:

> [The task force is organised to examine the need to review this fundamental idea. The task force will lose its raison d’être if you assume that everything will follow the existing fundamental idea. I’d like to stress the point so that there will be no mistake about that.] (Member (jurist), the proceedings of the 12th Task Force meeting, 2018)

> [And, as member XX said, I also actually didn’t quite understand what the plenary panel asked the TF for a report for.] (Member (jurist), the proceedings of the 12th Task Force meeting, 2018)

It was originally derived from the notion that the form of the output should be discussed after what should be regulated, but the focus of criticism then shifted toward whether guidelines or law should be appropriate from the professional viewpoint of law, falling into the same focus on output rather than issues at stake:

> [I disagree that the TF proceed to a discussion with the pre-set intention of laying down guidelines. [...] Regarding a concrete regulatory system, we should consider it after the debates on the essential attitude toward governance of the technology in various situations. Also, we should carefully discuss institutionalisation to be necessary and sufficient for the

balanced progress of life science in our country.] (Member (jurist), the writing opinion for the 2nd Task Force meeting, 2017)

[Some jurists may think that the technology should be regulated by law. However, I disagree with them, and I suppose we should not introduce legal control on genome editing now. If so, we must legislate for other things, such as research on human ES cells and human embryos. It could be quite inconsistent if we only establish a law on genome editing.] (Member (jurist), the proceedings of the 2nd Task Force meeting, 2017)

It could be some repetition of the earlier criticism raised in the Panel, where another legal scholar argued that non-binding guidelines among professionals for controlling the technology were unusual. Furthermore, the discussion moved on to a technical debate about whether the law should cover basic research.

TF member A (jurist): Regarding the law's scope, I don't consider basic research as the target of its regulation. We might need legislation on the clinical use of genome editing, especially for self-pay care. But basically, it should target clinical use, and for now, I don't care about legislating against the use of technology for basic research.

TF member B (jurist): Is that so? Actually, I think we should consider legislation on basic research on it.

TF member C (basic biologist): As a so-called basic researcher, I feel strange that laws control basic research. The future discussion could be necessary, but I'm afraid I have to disagree with the idea of legal control over the basic research itself.

TF member D (journalist): On whether we should limit the focus of the legal framework to clinical application, I suppose we shouldn't decide for now, although I understand the basic researchers' opinions.
(the proceedings of the 3rd Task Force meeting, 2017)

Again, the jurist members tried to discuss possible regulatory structures, such as the dual review process, following the regulation system in the other country (in this case, the UK). All such technical discussion furthered, leaving fundamental value issues, which could (and should) be discussed among a wide variety of people, unaddressed. In other words, it was not only civil

servants but also the TF members (especially so-called 'experts') that confused their agenda, sticking to technical matters on their own speciality.

The inclination toward technical debates was characteristic of legal scholars, who cited previous rules and debates as conclusive precedents that would not allow future changes in any debate. They did not let other people, especially lay members, question such premises because they were already discussed. Even when lay and other members raised the value issues, the legal experts insisted on the meaninglessness of the value debates, arguing that such discussions would *open a Pandora's Box*:

> [I suppose that many members might think that we should discuss general ideas on human embryos. But the Expert Panel previously addressed this topic, only to give up in their early debate. *We had better not discuss just an abstract agenda such as 'whether a human embryo is human or object' because it is unproductive*.] (Member (jurist), the proceedings of the 3rd Task Force meeting, 2017)

As can be seen in the early phase, we could observe expert members adhering to their respective professional viewpoints, which could exclude or sometimes diminish other members with different backgrounds.

The debates on technical issues turning away from *fundamental concerns* helped secretariats rush to a conclusion. The first three meetings were devoted to presentations by invited experts and deliberations on the discussion's focus at the TF. During the meetings, however, they did not address value issues such as why we need the technology or what we are concerned about the technology; instead, the TF spent the meetings on technical matters such as the regulatory scope and its format. In other words, what was at stake was how they were to act; issues such as for what purpose they were to act and why they needed to act were not involved in their purview. Consequently, the secretariats submitted a draft report of the TF in the fourth meeting, which jumped into a request to other ministries to establish guidelines on genome editing on human embryos for particular purposes, as if such a direction had already been determined. This rushed

conclusion and adhesion to the technical issues limited members, especially laypeople, to express opinions only about written expressions or phraseology.

Chair's Endeavour to Involve Diverse People

It is not fair to conclude that the policy arena was totally exclusive to others. In particular, the Chair endeavoured to include more people in the policy arena. In the meeting, she introduced her activities to other members as well as secretariats.

> [This is not today's agenda, but I'd like to share my experience as supplemental information. As I previously announced, I attended a public event held at The National Museum of Emerging Science and Innovation. Participants listened to my talk sincerely and gave me many comments in the questionnaire. I suppose the secretariats will later report the event, but I feel glad that they listened to the presentation attentively and thought of the issue as a matter of themselves.
> Also, I attended a patient group meeting and reported on the discussion on genome editing on this Panel. Here, we could again have an intensive discussion with the participants. I suppose the debates on the issue should not be limited to this Panel, and we need such involvement. If you come to know any opportunity, please let the secretariats know so that we can arrange a session to discuss with people.] (Chair, the proceedings of the 107th Panel meeting, 2017)

She mentioned that it was her status as a member of the CSTI that enabled her to take the initiative to make changes in the policymaking process. However, she also acknowledged that such activities were not sustainable after she resigned from her chairmanship. After her retirement, a new chair was appointed from external expert members, not rgular CSTI members.

Another Deficit Model and Technocracy?

There was more conflict that the expert members faced than one between experts and laypeople–dissension among expert members and invited experts, which took place after the TF's primary report. While MEXT and MHLW followed the TF's primary report and began the discussion on guidelines for the technology for ART research, the Panel and TF furthered the deliberation to consider using the technology for broader purposes. After

the primary report was published, the TF meetings were held jointly with its parent Panel. They again conducted hearings from experts, and then the TF was delegated to discuss three things which could further broaden the use of embryos:

- the conditions for approval for the use of the technology to research hereditary diseases and other illnesses
- the permissibility of creating embryos for basic research purposes
- desirable review systems

The TF had another hearing in three meetings and held two sessions for discussing the draft of 'the secondary report', which was published in June 2019 after public comment. Before its publication, there were several presentations on fundamental ethical issues around embryonic genome editing. In fact, however, such presentations were less considered in subsequent discussion and the concluding report, contrary to scientific information.

In this regard, we could point out more than just the government staff's neglect. First, a guest speaker invited to the TF aggressively insisted that the TF and the government had made a fundamental mistake, presenting himself as the only person who knew the *right* orientation in the policy discourse:

> [The process of embryonic development is plastic, […] so the initial answer to whether genome editing will be useful is that we don't know the core of the question. Without observing human development, we can't even imagine what the technique let us find anything new about it. It may sound impertinent, but from my view as a professional researcher, a person who talks about such a thing must be an amateur. We, professionals, would never be cheated by such an idiot story.] (Guest speaker, the proceedings of the 17th TF meeting, 2019)

He, with an academic background in developmental biology, denied any opinion provided by the members, leaving no room for discussion. He did not rationalise the different understandings or viewpoints and just accused others of not having the *right* knowledge about the issues.

TF member 1: XX (Guest speaker's name) has expressed concern about using human embryos as tools, but this Panel also shares the same concern. Basically, we haven't discussed the issue with such an intention from the beginning. Based on such an idea, we have been discussing what kind of rules are appropriate if we treat human embryos as a subject of study.

Guest speaker A: You told me that you're not thinking of 'using' embryos, but in a word, that is the very idea of exploiting human embryos. What you're thinking means exactly that you're objectifying human embryos, I suppose.

(The proceedings of the 17th TF meeting, 2019)

TF member 2: When the Panel established the 'Fundamental Idea', I suppose people thought human embryos are precious and special. Nevertheless, they are also necessary from a scientific perspective, and in fact, they were sometimes discarded. I suppose that's why they made a rule about the utilisation of embryos that are otherwise to be disposed of.

Guest speaker A: That is different. That is the point you're missing. What I felt at that time was that the idea of utilising the embryos because they have scientific significance itself is exploitation as long as you're thinking of objectifying humans. So, I couldn't understand the statement.

(The proceedings of the 17th TF meeting, 2019)

In this regard, it should not be wise to place such experts against the permission on the same side as the laypeople who were cautious about the techniques just because both were concerned about the technology. Throughout the meeting, the presentations often criticised all the government's decisions and the direction thus far. These arguments could require that the government and TF members should overturn not only the current direction but also previous discussions, which was hard for them to accept. Such an aggressive attitude toward different opinions was different from one of the lay members, who rather tried to table different perspectives:

'Only the opinions of researchers who are at the cutting edge tend to stand out, but given that authorities are discussing each other through books, conferences and peer-reviewed journals, I think such discussions among them are rather unnecessary in the Taskforce and other committee meetings, where we are trying to do something that is a matter of policy.

> What will we do in terms of policy based on the opinions of such specialists? How could the government inform the public? That is what we should consider, I suppose. And when I say that, it gets easier for others to speak out.' (Interviewee X7, representative of patient groups)

The Engagement of Civil Servants without Hesitations

The debate after the TF's primary report also saw an acceleration of the debates toward the permission of the technology. The second report proposed permission of the things below on the premise that institutional review boards (IRBs) would examine the scientific and social validity of individual projects:

- the use of the techniques to research hereditary diseases and other illnesses
- creating embryos for basic research regarding ART

Regarding the review system, the report raised several procedural points for reviewing individual projects and again urged MEXT and MHLW to establish guidelines for IRB based on those points.

Formalisation of Lay Engagement

Through the joint meetings of the Panel and TF following the publication of the TF's first report, we could see an escalation in the formalisation of lay engagement. The secretariats organised several hearings from experts during these joint meetings. The secretariats explained their aim:

> [One of the purposes of the joint meeting is to have a consensus on the direction of the policy debate. Now, we are to make a policy decision, but if the TF and the Panel address the issues independently, there could be disagreement, which would make the whole policy discourse troublesome. We expect the joint session for hearings could avoid such a conflict.] (Secretariat, the proceedings of the joint session of 109th Panel and 8th Task Force meetings, 2017)

However, the content again focused on basic technical concepts and introductory issues around the genetic intervention in embryos rather than updates on the technology. Given that the TF and the Panel had already

discussed the issues and released their reports, the hearings themselves did not have such effects as the secretariats explained; rather, they were just a performance.

In this regard, a representative of patient groups, who initially questioned the predetermined trajectory of the deliberations and sought to open them up, mentioned how they were treated during this phase:

> 'When I attended joint meetings, I was treated as a witness. I was only given one or two chances to ask questions. I think that is the difference between a witness and a member' (Interviewee X7, representative of patient groups)

Officials' Intervention in the Deliberation

It is also of note that the secretariats not only provided the future agenda for the TF but also suggested a possible conclusion, which means that they tried to control the goal of the discussion. For example, at that moment, they had not decided whether they should approve the use of genome editing on human embryos for researching hereditary diseases and other illnesses. However, the tone of the agenda provided by the secretariats was more assertive:

> [We (secretariats) suggest to the Panel that it should make a decision based on the TF's technical consideration to the approval of basic research using genome editing on human embryos to understand the mechanism of intractable diseases and cancer, especially hereditary ones, under certain conditions.] (Meeting materials provided by the secretariats for the joint session of 112th Panel and 11th Task Force meetings, 2018)

The expression '容認について検討 (consideration to the approval)' was different from '容認するかどうかについて検討 (consideration to whether we would approve or not)', and this forceful expression aroused the Panel member's question. They remonstrated the secretariats' rush to a conclusion, arguing that there were many issues to be addressed before a decision could be made. However, whereas the secretariats revised the written expression, they did not change the basic attitude. This kind of takeover by the

secretariats could have been perceived as arrogant by some members of the TF.

> [Compared to the first report, looking at the part that says, 'We suggest that the Panel should approve' blah-blah-blah, I'm concerned that it seems to indicate the direction of acceptance in a rather sweeping way - I understand that this is rather a tentative propose, though.] (Member (journalist), the proceedings of the joint session of 112th Panel and 11th Task Force meetings, 2018)

However, the verbatim proceedings of the meetings indicate that the secretariats' steering of the policy discourse continued, and they sought to reach a conclusion without going through in-depth deliberation at the Panel. Following the joint meetings, the TF held another three hearings but did not conduct robust discussions on the conditions for approval. Nevertheless, at the next meeting, the secretariat submitted the draft of the second TF report, which determined the requirement for the green light. Their proposal was that the Panel should give general approval to the technology, delegating all consideration of ethical and social issues around each project to IRBs. It could have seemed that the officials had rushed to approval, bypassing policy deliberation on its ethical and social issues. In other words, the place for policy discussion and decision-making shifted toward 'behind the scenes', being distant from society and the publics.

How could the secretariats take over the expert's deliberation? To answer the question, it could be worth paying attention to the fact that the deliberation did not rely on the advisors' scientific and technological expertise to provide legitimacy for their policymaking, as technocracy and so-called 'evidence-based policymaking' argue. In this regard, interview analysis could provide more about the limited attention to *evidence* in policy deliberation. When asked about the progress of the debate, a member of the Panel expressed suspicion about the progress of the discussion conducted by civil servants, which neglected factual evidence for reasoning:

> ‘What I worried about the most is... how the decisions were made, particularly in the later stage of the debate. I worried that the panel drew conclusions from quite a fragile line of reasoning. I mean, it’s not only about a simple explanation such as “We should consider it is ok for the reason that blah-blah”. But rather a construction of argument using, for example, scientific data or appropriate references, well, so you don’t need to limit to scientific issues, though. [...] I’m rather open to approval, but there are too few descriptions for the conclusion, such as evidence, backgrounds or the progress of the discussion.’ (Interviewee X6, journalist)

Their complaints mean that the deliberation at the TF was no longer knowledge-making based on the rigid expertise of the members. The interviewee explained the details in the conversations at the meeting:

> (Interviewee)
> ‘There is no case. We don’t freeze embryos before reaching a blastocyst in Japan.’ Ok, then, why don’t they provide the source data? Is it ok to believe it just because an individual on the panel orally explained, ‘there is no case’?
>
> (Interviewer)
> Do you mean the Secretary didn’t carefully examine the factual evidence?
>
> (Interviewee)
> No, they didn’t.
> (Interviewee X6, journalist)

The New Regulation for Whom?

What, then, was the motivation for establishing a new regulation? Interview analysis revealed that neither the state nor the research community was so ambitious in enabling the research. They provided a new regulatory framework in response to the request of research communities, but it did not lead to the promotion of studies in human embryonic genome editing.

> (Interviewer)
> I think I’ve seen some news reports that the green light for embryonic genome editing was given by the Japanese government, whose attitude was the go-ahead. But what you’ve told me that…
>
> (Interviewee)
> That’s not accurate. What we’ve often explained is that our basic attitude is,

> ‘Fundamentally, human embryos cannot be intervened’. This is the central premise. First of all, you can’t intervene in them. [...] So, I mean, the regulations provide an exception to this fundamental rule. [...] So, I don’t want to be reported that we were go-ahead. The Cabinet Office says they are talking about quite an exceptional situation, and we’ll answer the same if asked. *And for your information, there has never been a research project under the new regulations*.
> (Interview with MEXT official who was in charge of the Panel)

In this regard, the civil servant mentioned that there was concern among the academic community about undertaking activities not permitted, connecting such attitudes with national characteristics in this country.

> ‘There is a critical perspective that recognises that the scientific side pays little attention to social aspects of scientific issues, ending up neglecting ethical concerns. But in this case, you told me the opposite pattern. I mean, the scientific side was worried about the scientific issue and requested the government’s control. On the other hand, the government asked academia to consider it more by themselves, which led to discord between them.
> Well, I suppose there is a Japanese temperament. There is no argument like, “Everything which is not forbidden is allowed”. We’ve received quite a few inquiries, such as, “Is it really allowed?”, “The regulation says blah-blah, but could we be permitted to do like that?” or simply, “Is there any rule that regulates this field?”. So, I suppose we haven’t experienced any trouble in this field, and it’s because of the Japanese tendency to avoid things that are not forbidden. In that sense, the academia in this country requested state control in this field. How should I say… I think it represents a sort of Japanese character.’
> (Interview with MEXT official who was in charge of the Panel)

According to the official, researchers were worried about conducting activities out of state control because of the fear of criticism in case of trouble.

5.3. Imagined Publics and the Legitimacy Around Them

Publics as Ignorant Followers

Based on the analysis thus far, I would characterise the dominant form of the Imagined Publics in this case as *ignorant followers apart from the policy arena*. Such recognition was evident in the conversations among the experts and could also be suggested from the imaginaries of others

constructed and shared among actors in and around the policy arena. Actually, these imaginaries are relative, in terms that they are co-constructed, reflecting the relationship between actors and the comparisons among them. Therefore, it should be worth examining the imaginary of the Panel, civil servants, and science as a sort of reference to the Imagined Publics. Here, I would first explore the Imagined Publics through the examination of the imaginaries of these actors.

Particularly in the early phase, we saw an aggressive self-imaginary of the Panel that could reinforce the Imagined Publics as *ignorant*, which was inconsistent with their official status of 'the place of wisdom', as they insist on their website: namely, *the elite political authority with knowledge*. Although the administrative structure based on the image of 'the place of wisdom' did not give any legally legitimate authority in policymaking, the Panel considered themselves eligible to decide the future direction of the technology firstly because they were experts. These findings could show similarity to the previous studies of scientism in the UK (Welsh & Wynne, 2013), where science and other academic expertise have obtained public and political authority, extending beyond their scientific and academic domains. These can also be consistent with Fujigaki and Tsukahara's criticism of the administrative decision-making process for energy policy in Japan, where they analysed the nuclear plant accident caused by the earthquake, finding it closed to the public (Fujigaki & Tsukahara, 2011). Therefore, the present result could indicate that their previous arguments are also valid in Japanese life science policy, and this authoritative imaginary of the Panel could highlight the contrast with the *ignorance* embedded in their Imagined Publics.

However, by paying more attention to another imaginary of the Panal as *the outsiders of science*, I aim to further consider the construction of the Imagined Publics in this case. When the Panel members faced the technical issues of science, they gave up *being experts*, while they still recognised their authoritative status. Also, when confronted with controversial matters of

value, they avoided core decision-making regarding policy direction, just giving detailed technical conditions around the technology. In a way, these seemingly conflicting self-images held by the Panel represented a bipolar division into those with expertise and those without, cooperatively strengthening the Imagined Publics as ignorant. On the other hand, these imaginaries of the experts can also suggest that the imagined hierarchical relation that subordinates the publics *as followers* does not always connect with the level of knowledge.

In this regard, we may want to focus on the civil servants' explicit attempt to control the deliberation and policymaking, which were more pronounced than the case in the previous chapter. The below discussion could suggest, to some extent, that we should distinguish the dismissal of the publics in this case from ordinary technocratic notions in the conception of scientism.

The Legitimated Intervention by Civil Servants

The case demonstrated the overt and active intervention of civil servants in the policy arena. In particular, the latter phase of the policy debates revealed that the expert deliberation committee had become merely a rubber stamp for the secretariat, which means that policymaking became largely in the hands of civil servants. However, it should be noted that such interference is not unique to this case; indeed, we could observe similar intentions of committing to the deliberation in complementary interviews with a civil servant who has experience as a secretariat of advisory committees. In talking about their experience of administrating the panel, they were outspoken about their open involvement:

> (Interviewee)
> We were coordinators at that time. This issue wouldn't have been discussed as long as we had left it unaddressed; indeed, nothing was done until then. We coordinated the process of setting a theme first, gathering people who could help us with that theme, and then putting it together in one document while listening to each participant's argument. That's what we did.

(Interviewer)
Taking the conventional government in mind, we can imagine that officials have often been criticised for having their own ideas about what they want to do and, conversely, conveniently 'picking up' the knowledge of experts and referring to it so that it fits their own inclination. What do you think is the difference between that and the role you have just described?

(Interviewee)
Well, I think *the officials have to determine a direction to some extent, taking and rejecting information when necessary* because, you know, we can't incorporate all opinions, and *if we write a report as experts request, the entire story will lose consistency*.
(Interview with MEXT official with experience in committee administration, emphasis added)

It should be worth considering that the interviewee explained that officials '*have to determine a direction*' of the policy, which means that they saw it as their professional duty. In contrast, when asked about their views on the people's resistance to lockdown measures against the COVID-19 pandemic in Western countries, they expressed concerns about where responsibility lies:

(Interviewee)
'*I admire them, given that individuals are acting with such a sense of responsibility.* But I wonder whether they have the knowledge, judgement and understanding to match their enthusiasm. I don't mean to imply that "we bureaucrats are great." or that "we are different from you, poor people, and you can rest assured if you leave the matter to us.". But we make decisions by accumulating various discussions in the course of analysing, organising and analysing the situation while listening to the opinions of multiple people in the field, don't we? On the other hand, ordinary people make a decision based on what comes in at the moment and their own life experience, so *the simple question arises as to whether it is a rational decision for all. Well, I think it could be an option if it can be sorted out based on the logic of responsibility, that "it is your choice, so you are responsible for the decision; it is my choice, then I am responsible for the decision"*". (Interview with MEXT official with experience in committee administration, emphasis added)

Certainly, they were concerned about ordinary people's capability in decision-making in terms of their level of knowledge and understanding. However, at the same time, they also expressed a fundamental question about whether

people could take responsibility for their choices to others. In other words, they consider civil servants' active engagement as a more *legitimate* action in the policy arena than that of the publics, focusing on responsibility.

To use another metaphoric explanation, we could compare this bureaucracy's strong leadership over the publics, who were separated from the policy arena in the developmental states, to a traditional relationship between TV broadcasts and *viewers*. The creators produce TV programmes to positively influence the audience, rarely asking them directly about what they want to watch because they are presumed to understand people's preferences, desires, or interests. Unlike actors or newsreaders, such creators seldom appear on the screen but instead coordinate different resources and actors to organise programmes. In this figurative framework, civil servants act as creators, or more specifically, *scriptwriters* and *directors*, who substantially determine the entire storyline of the policy drama. In contrast, elected politicians or scientific experts can be compared to the actors to whom the viewers pay immediate attention. The viewers, equivalent to the publics as *ignorant followers* in this metaphor, passively consume the content provided by TV stations but seldom propose new programmes; at best, they can only express their preference individually through inquiries or collectively through viewing rates. What is worse is that in the actual situation, these *viewers* cannot switch channels even though they do not like the *programme*. The case in this chapter could support the existence of the hierarchical relationship that encompasses a one-way flow of communication.

As a result, the *viewers* of the policy drama received limited, if any, attention. In this relationship, they were considered by the government as just beneficiaries but never recognised as collaborators or judges. Public engagement or listening to different opinions was not considered to improve the government's science policy-making, which happens in parallel; on the contrary, arguments against the government's predetermined direction could even be regarded as democratically detrimental. Thus, such activities

basically aim at 'ガス抜き (letting off some steam and frustration)', which is neither supposed to improve input nor output legitimacy. In Fiorino's terms of engagement, they aim for neither substantive nor instrumental benefit to policymaking. Rather, it was just a passive, formalistic procedure for avoiding normative criticism. However, this lack of sincerity and the civil servants' recognition of responsibility could be two sides of the same coin; they recognise that it could be irresponsible to let the publics or others decide the policy direction, as was evident in the press interview of the then Chief Cabinet Secretary after the backlash. Thus, to describe the case more precisely, we might want to stress the governmental imaginary of the publics in the developmental states instead of applying the Western scientistic imaginary, which stems from a different root.

Democratic Legitimacy in Developmental States

Therefore, we need to be careful not to interpret this merely as authoritarian domination by a bureaucratic government. As previously introduced, Johnson (1999) explained that the Japanese bureaucracy's legitimation 'occurs from *the state's achievements*, not from the way it came to power' (emphasis added). Here, to discuss whether these interventions could be considered just a corruption of democracy, I will offer an additional interpretation, reviewing several considerations of democratic legitimacy in Japan.

Output-oriented Legitimacy

Johnson portrayed the Japanese bureaucracy in his book, parodying the adage of England's constitutional monarchy[43], as '政治家は君臨し、官僚が統治する (the politicians reign and the bureaucrats rule)'. This phrase shows that the system clearly separates reigning and ruling, and most

[43] Original aphorism is 'the Queen reigns, but she does not rule', attributed to Walter Bagehot (British Monarchist League website: https://www.themonarchists.com/constitutional-monarchy-a-tradition/).

substantial policymaking tasks are assigned to civil servants with legitimacy. It should be noted that while the bureaucrats did make a policy decision, they did not decide based on their individual political preferences. Nor does it diminish the role of politicians; the bureaucrats can make policies effectively only when the reigning politicians allow them to exercise their tasks without political constraints. Conversely, civil servants could handle policymaking as long as their agenda does not encroach on the realm of politicians. It could appear political from a Western viewpoint, but they act as *not being political,* which can be seen in their self-introduction as 'experts in policymaking'. In STS terms, we could argue that the policymaking structure in developmental states, unlike many Western countries' systems, involves another robust boundary work between *policy* and *politics*, which might require us to consider in addition to one between science and non-science (Gieryn, 1983). In this regard, Johnson explained that the bureaucratic policymaking in this country holds legitimacy in the sense that 'their claim to political power is *based on some source of authority above and beyond themselves*'.

Let me add more in-depth considerations of legitimacy, referring to Scharpf's typology (Scharpf, 1997b, 2003) of input and output legitimacy. As for the input side, the pursuit of 'the state's achievement' in the developmental states indicates that bureaucracy's policymaking in these countries faces little pressure to improve input legitimacy: listening to the opinions and preferences of society. Unlike elected politicians, civil servants in these countries are not technically endowed with any foundation of the democratic support of the publics for their policymaking. However, their policies during the post-war economic recovery, for instance, were legitimised as long as they could achieve national prosperity because they coincided with the government and most members of the Diet's preference. Such achievement is presupposed to be *good for people*. Indeed, governmental science policy since post-WWII in developmental states has aimed from the very outset at achieving national prosperity that would lead them to the advanced countries club (In this regard, Jasanoff and Kim's (Jasanoff & Kim,

2009) explanation of 'atoms for development' in South Korea, the sociotechnical imaginaries around nuclear policy in another developmental state, could exemplify this policy direction). Therefore, the government generally tends to believe, without asking politicians for word-by-word instructions, that pursuing scientific advances is democratically and morally appropriate and would not meet with opposition. Turning to legitimacy again, the bureaucratic science policy-making in Japan does not encompass input legitimacy in its very process but instead requires legitimate purposes as 'the state's achievement', which is supposed to externally provide input legitimacy. On the other hand, it is not easy for bureaucrats to recognise the necessity for improving the input legitimacy because, for them, the appropriate direction is already given, and they take its input legitimacy for granted.

Regarding output legitimacy, the policy's efficacy and efficiency for meeting the publics' preference, we could explain that the bureaucratic science policy-making in the developmental states itself needs to stress more on output legitimacy and rely too much on scientific, or more precisely, academic or technical knowledge, which is supposed just to improve the quality of the final policy output (in this case, the regulatory framework). The division of labour between politicians and civil servants makes officials hesitant to deal with controversial value issues in their policymaking process. As the desired direction is already pre-set among them, their efforts for improvement inevitably concentrate on achieving the goal more efficiently and effectively. In this sense, policymaking in developmental states seemingly goes well with technocratic decision-making because science or opinions raised by scientists suit their needs, and such information can externally provide a ground for their decisions. Such unified logic or explanations offered by science could externally legitimate the decisions in the policy institutions, allowing civil servants and their policymaking to avoid being seen as political.

On this point, however, such reliance on science could just be gaining legitimacy from the outside, and scientific rigorousness could easily be out of their scope. In the case analysis, we have seen the neglect of rigour in evidence provided in the meetings. One member I interviewed expressed unpleasant feelings about the secretariats' acceptance of arguments without providing factual or scientific evidence. This feature was observed not only in the bureaucracy but also in the policy discourse as a whole; there were several hasty arguments, such as taking immediate action or establishing legal frameworks, citing the other countries' examples as references. In this regard, the 'global trend' could also be a persuasive argument or a source of legitimacy that comes from outside and above themselves, and they pay less attention to the way it comes to be persuasive.

Further interviews with other officials have shown that it is rather a common feature of Japanese political culture. In the conversation, a civil servant expressed a sense of difficulty regarding gaining an understanding of their strategic research area prioritisation and plans for promoting the targeted area:

> (Interviewee)
> (Regarding research area prioritisation and strategy for promotion) We are frequently asked whether the decision is 'correct'. You know, few people would understand it when we explain that 'The decision is OK because we have made it employ a procedure like blah-blah-blah'. This could happen either inside or outside the ministry, so we have no choice but to persuade them by saying, 'look, this target funding project has produced splendid results like these'.
>
> (Interviewer)
> You mean..., people such as staff at the Ministry of Finance whom you ask for more budget on the research field?
>
> (Interviewee)
> Yes, but not only them but rather any people concerned, except policy researchers, who show interest in our procedure. (...) 'The decision is made via a strict procedure' cannot convince many people that the targeting strategy is sound. (...) Basically, a systematic approach is not sufficient, and there are counterarguments like, 'You'd better consider this

viewpoint, which you're missing'.
(Interview with MEXT official who led a strategic research area promotion programme)

They argue that procedural rigidity does not provide sufficient legitimacy to conclusive decisions in this country, even among civil servants. Instead, people tend to be concerned about the quality of outputs, which embrace a retrospective mindset in their consideration of legitimacy. In other words, civil servants do not introduce scientific and academic expertise by themselves but rather rely on scientific advisors in expert committees as the authority who provide the government with *correct answers*, which ought to secure output legitimacy.

It could sometimes be difficult, however, to secure the *correctness* of the output. Therefore, civil servants try to make the result plausible and understandable to those outside the policy arena:

(Interviewee)
You know, the committee members aren't the only ones to discuss. If necessary, we could call in other experts, and actually, we called in them. But if the panel looked to have a particular inclination or biased opinion, some researchers would be reluctant to participate in the discussion, or even though they cooperated, they would look at the panel with suspicion.

(Interviewer)
Is that one of the reasons why you'd chosen some big names? Did you invite them so that the conclusions of the advisory committee would have a strong influence?

(Interviewee)
Certainly. It might sound measly, but *the fact that we've discussions with those highly respected in the field is connected with the credibility of the panel and of the proposals and policy documents that result from that deliberation*. I suppose it can be the nature of officials to seek to choose someone that people would say, 'is this conclusion led by them? then, we'll follow it'.

(Interviewer)
Credibility to whom? Mainly researchers?

(Interviewee)
Yes, the research community should be the one, but not only them… At the time, there was

> a notion among people that radiation was something to be scared of, so we needed credibility toward them, the public. *We wanted to show that* '*it's not a biased argument. It was put together by proper and reliable people*'. (Interview with MEXT official with experience of committee administration, emphasis added)

True, it could be similar to other engagement activities, such as public comment, in terms that both are performative. However, there is a difference in the motivation; on the one hand, such engagement activities that secure that the policy process is open to any opinions are more intended to be self-sufficient as a procedure; on the other hand, the above tactics in the choice of membership and witnesses summoned to advisory committee meetings the interviewee are more purpose-oriented actions, and the attention is paid to the satisfaction of those who are outside the procedure.

The Legitimacy that Comes from Responsibility

In addition, I would like to remind readers of the negative attitude of the representatives of academic societies who requested the government to provide a direction and make guidelines regarding embryonic genome editing. Again, it is not found only in this case. I conducted a complementary interview with an ex-civil servant to gain their views on the negative attitude seen in the case. Nodding to the situation explained, they complained about the negative attitudes of policy actors who had been around them:

> 'After all, *there are so many people who don't take responsibility, responsibility for their own actions*. Few people think and act on their own, and *many others want someone to decide*. They don't want to impose their opinions on others, so they need some 'royal warrant' or some authorisation. […]Well. Japan is seemingly a democratic country, but it isn't actually, is it? Well, it's difficult to explain, but there seems to be a difference in individual responsibility. *Democracy nowadays is regarded as a fruit of the struggle for freedom, isn't it? So, how they secure freedom is placed as the first question or a basic assumption. However, I have the feeling that such a basic premise regarding politics is slightly different between Japan and Western countries*.'
> (Interview with ex-MEXT official)

They, who had experience living in the US, gave a critical opinion against the attitude in decision-making in Japan. In their views, policy actors tend to

obey an authoritative entity, but in turn, they require such an authority to set a direction and make a decision for them. This relationship could be another factor that provides legitimacy to bureaucratic interventions.

Cultural studies have indicated a shared Imaginary of the Japanese government that gives them an intrinsic legitimacy: the notion of 'お上 (*Okami*: governmental authority)' (Kuroda & Imata, 2003; Maclachlan, 2013). The term, which literally means 'those above', has referred in everyday life to the 'government', and the usage represents its hierarchical relationship with the publics, which is not held only by the government but rather widely accepted by society (Schwartz, 2013). Also, the bureaucracy in Japan is generally regarded as the most elite meritocracy. This public imaginary of the government implants obedience and deference to the authoritative government and surrounding advisors in the other societal actors. We have consistently seen this attitude in the representatives of the academic societies in the first phase of the case. The representatives' obedience and dependence could, in turn, provide the bureaucracy with the visible legitimacy of being a decision-making body, which could be different from the way Western governments represent themselves (even though it is a pretence).

In terms of paternalism, the imaginary as *Okami* entails more ends-related paternalism (Le Grand & New, 2015). Technocratic control over the publics encompasses means-related paternalism, which justifies their decision-making by claiming they are assisting in the achievement of the people's desire by applying their technical expertise to provide the appropriate measures. On the other hand, *Okami* paternalism is concerned more with the intervention in the identification of the ends themselves. True, Le Grand and New admit that means and ends are easily entangled, but we could argue that paternalism in Japan can slip into stressing ends-related paternalism more easily.

Again, we need to be careful that, as Johnson argues, this legitimacy is 'not one of Weber's "holy trinity" of traditional, rational-legal, and charismatic sources of authority'. Rather, it could be a derivative of the input legitimacy of the developmental states; the authoritative justification only comes from the devotion to widely believed-in revolutionary projects. This could be in harmony with the interviewee's notion of professional duty in intervening in policy deliberations. In other words, this type of legitimacy is the opposite side of the same coin to the government and other authorities' responsibility.

It should be noted that as the bureaucracy holds jurisdiction over the public interest in this country, the institutional legitimacy for the action of decision-making can sometimes be mixed up with the perception of a legitimate entity as an authority (thus, Okami). This confusion in legitimacy and authority should not be limited to the bureaucracy; rather, it could have resonance with the Panel members' self-recognition and their reputation in society as the authority, despite their lack of knowledge concerning the very scientific technology dealt with in the policy deliberation. It is true that their self-recognition could be based on the Panel's institutional status that is close to the Prime Minister, but generally, if someone in this country becomes an authority in one field, they tend to have supremacy even in other fields.

This is visible in the country's early response to the COVID-19 infection (NHK, 2020). In July 2020, Yasutoshi Nishimura, the then Minister of State assigned to cope with COVID-19, created an Advisory Board to review the government's measures for the pandemic using AI simulation. The board was comprised of four influential figures in the country's academia, including Shinya Yamanaka, the 2012 Nobel laureate in Physiology or Medicine. He was an expert in regenerative medicine but not in infectious diseases or computational science. In such a situation, suitable expertise for the issue is not at stake; instead, what matters is whether they have gained a title as *an expert*. They need to cling to their own expertise to keep their authoritative

status in policy deliberations. Again, we need to carefully pay attention to their crossing boundaries. Yamanaka also voluntarily launched an information website regarding COVID-19. On the website, we can observe his strong notion of responsibility:

> [I am not an expert in infectious diseases or public health. However, as a medical researcher, I have wanted to do something about the new coronavirus, which has become a threat to humanity, and I started disseminating information on 15 March 2020.] (Website 'Shinya Yamanaka's information transmission site on COVID-19')

However, for this reason, public scrutiny focuses more on the output, which turns into a sort of requirement and the criteria for legitimacy. This pursuit can be simplified into whether the output results in correct answers in terms of people's preferences and benefits, which reinforces an inclination to output-type of legitimacy that lacks attention to the process to reach the very output, which I described in the previous section. This could be widely seen in the Japanese science policy field.

One typical example can be seen in the news coverage about the government's responsibility for scientific uncertainty. In June 2022, the Supreme Court ruled the nation's government was not obligated to compensate victims of the 2011 nuclear accident caused by the unpredictable tsunami. Pointing out that the actual earthquake was far greater than the evaluation reasonably conducted by the government agency and that the best knowledge at that time could only consider a seawall as the only preventive measure, the top court concluded that 'it has to be said that an accident would still be a substantial possibility', even if the government had exercised regulatory powers to order the company to take preventive measures against flooding. Nevertheless, the Editorial of Asahi Shimbun (one of the country's leading newspapers) criticised the government, pointing out its responsibility that lies regardless of procedural and technical reasonability before the accident:

> ['*If the worst were to happen by any chance, they nevertheless should not allow a nuclear plant disaster, which causes irrecoverable harm to the environment as well as human life and health'–if the Court had this mind, they would never reach such a conclusion*. […] Nuclear plant operators and nuclear safety regulators have an obligation to take all possible protective steps based on the latest scientific knowledge and the principle of safety first to be prepared for any eventuality.] ('Editorial: The Top Court exempt the state's responsibility for the nuclear accident–unreasonable escape into "beyond expectation"', Asahi Shimbun, June 18, 2022, translated by the author)

According to the editor, the responsibility should lie on the government once an undesirable event occurs because such an event should have been avoided at any cost, regardless of its capability. Policy measures taken at the time turned out retroactively to be illegitimate because they did not lead to the desired result. Applying Pellizzoni's typology, we could explain that the dailies do not allow accountability as the form of responsibility.

This notion could be even more vivid when both Japanese and English-translated versions of the same editorial's title are compared in the following table.

Table 5.2. Comparison of the Title of the Editorial of Asahi Shimbun

English	Original: Japanese (translated by the author, emphasis added)
'Top court ignores state's duty to do utmost to secure nuclear safety'	'Top court exempts the state's responsibility for the nuclear accident - *Unreasonable escape into "beyond expectation"*'

In the original Japanese version, they clearly criticised the excuse of 'beyond expectation' using the word 'unreasonable escape', which means that they placed the target of censure on the subject of the verb 'escape'–i.e., government, and did not allow any legitimacy in unavoidability regarding risk management. Policy measures taken at the time could turn out retroactively to be illegitimate because they did not lead to the desired result, apart from their capability of coping with the accident at that time. In

contrast, while similarly critical of the result, the English version omitted this point of accusation and shifted the target of criticism to the top court which 'ignore[d]' the state's duty. The English title also uses 'utmost' to explain the government's responsibility, which means that the evaluation can be subjective and allows space beyond the maximum capacity of the subject. More specifically, while the English version acknowledges the accountability-type responsibility in the governmental measures for prevention, the original Japanese version embraces the care-type responsibility, in which the responsible entity should be blamed regardless of what they could do at that moment. The aggressive criticism of the government in the Japanese title could be provided so that it could resonate uniquely in the Japanese context.

But how is this article different from critical commentaries against government and other authorities commonly observed in other countries? To answer the question, a unique culture surrounding mass media in this country should also be referred to. The 'Press Club' system attached to all major institutional sources, including governmental organisations, formulates a closed information cartel that excludes non-member journalists from attending regular press events (Krauss, 2019; Mcneill, 2016). Instead, these arrangements secure information provided by such official sources for member journalists without the need for individual investigation. Of importance is that the system was not coerced but rather defended by the very members of the club, and there can be some peer pressure that restricts scoop-finding investigation as a violation of the coalition (Fackler, 2016). In other words, while they claim themselves as a watchdog of authority and criticise the governmental pressure, they positively rely on such insider status that assures exclusive access to authority, accepting power hierarchy or even following suit.

As a result, even if a scandal breaks, the focus of coverage with little individual investigation is at most on embarrassing or punishing the authority. This leads to an endless series of apologies from executives while

rarely leading to serious media-led discussions with detailed investigations of underlying problems, let alone suggestions for their possible solutions (Legewie et al., 2010). However, this lack of journalistic investigations by media indicates more than just a deterioration of professional journalism; rather, it could represent or even co-construct the country's culture that emphasises care-type responsibility, focusing on the end result and who was to blame, rather than accountability, which considers how the result was brought about. Cynically speaking, detailed journalistic investigations are not necessary for examining the responsibility here.

The adherence to output legitimacy entangled with care-type responsibility could push civil servants to be more inclined to shrink back from challenges that have risks of making mistakes because mistakes are not allowed to them. In the interview with a civil servant, they explained that when they tried to introduce an engagement practice into policymaking, they faced a strong objection that reflected such a notion of *infallibility*:

> 'I was somewhat hurt because it was said to me by several people, including my boss, whom I thought I had a certain amount of respect for, and a younger guy a bit below me, whom I thought was a good guy.
> Their point is that… when you go out to the place, like the website of the stakeholder engagement event, or the engagement event itself, you get quite a lot of comments like "Isn't this policy of MEXT wrong?" or "Are you really reflecting on your past policies?". It means that MEXT is beaten up in front of all kinds of people, including the media, including politicians. You know, in a sense, we are just receiving complaints. In some cases, you can answer accurately and break down the argument, but in other cases, it becomes clear that the policy was wrong in hindsight or that the policy did not go as we had intended and then exhausted the target of the policy. And in the latter case, you'll see as if MEXT are trying to make excuses, only to just pour fuel on the fire of researchers who are saying, "Screw you, MEXT!". Then, *my colleagues used to say, "Why are you going to all the trouble of going out in front of the public and taking time out of your busy schedule just to receive complaints about MEXT, it's meaningless", or "Don't disgrace us MEXT in public", quite a lot of times*.'
> (Interview with the MEXT official who led the stakeholder-engagement project)

According to them, it was not only a part of the workplace that such hesitation is shared; rather, it seems to be widespread in the governmental institution as a whole. More in detail, the official continued to explain how they preferred such avoidance:

> 'The conventional approach had been that, you know, you have big-name professors on the council, and while listening to them to some extent, you explain what you want to do and get the board to say OK, then you can get a budget and make a policy as you wish. So there had never been such a process of being shouted at or complained about ourselves on the internet or in public, like, "people are troubled by your policy; it's not proper". So in that sense, well, it's natural that some staff don't like it. Their pride might have been hurt, or they might have felt uncomfortable. I don't know how they really felt then, though.'
> (Interview with the MEXT official who led the stakeholder-engagement project)

This strong requirement for the government regarding responsibility and infallibility could explain the feeling of the ex-official I interviewed that 'a basic premise regarding politics is slightly different between Japan and Western countries'. The social compact between the government and the people in this country tends to stress more authority's responsibility, which could allow other actors to escape from taking responsibility in decision-making. Moreover, this exchange between responsibility and active engagement is not coerced by the members of the inner policy circle but, to some extent, is required by those outside the circle.

These articulations of civil servants' active commitment in this country could provide a basis for the Imagined Publics *as followers*. The emphasis on output legitimacy in this community could subvert the importance of active engagement of the publics for securing input legitimacy. In addition, the exchange between responsibility and engagement could eventually diminish the people's active engagement and expression of opinions in the policy arena. This societal structure could provide a firm foundation for the Imagined Publics in this country, which could be the core factor in the stagnation in the involvement of the publics in the policy arena.

5.4. Chapter Postscript: Meaninglessness of the Procedural Legitimacy and Scientific Rigour

In this chapter, we have observed the dominant form of the Imagined Publics in the policy deliberation on the regulatory framework for human embryonic genome editing. The Imaginary, *the ignorant followers of science policy drama distant from their lives,* could be co-constructed with imaginaries of other actors, such as experts or civil servants. I also employed another metaphorical explanation of TV scriptwriters and distant viewers to articulate a detailed relationship, but my focus was the imaginaries constructed in the relative entanglement between actors. Such imaginaries could reflect social compact or contract among social actors and represent the legitimacy and responsibility of actions to others. In particular, the strong adherence to output legitimacy and governmental responsibility, which was provided both by bureaucracy and other policy actors, as well as the society as a whole, could provide a reason for the neglect of public engagement in the policy discourse.

To put it another way, the analysis in this chapter suggests that the seemingly technocratic and scientistic dismissal of public engagement in the case actually does not prioritise scientific expertise itself. Scientific knowledge is regarded just as a tool to be utilised in securing output legitimacy: improving the feasibility of the arguments and decisions that are aimed at meeting people's preferences and being good for people. Therefore, such reliance on expertise can be easily mixed up with the dependence on scientific celebrity but eventually taken over by civil servants' interference due to the prioritisation of responsibility for decision-making. These findings will be further examined by comparative analysis in the next chapter.

What would happen in a society with such a notion of legitimacy? One typical ramification could be consistent with the lack of procedural rigour. Indeed, the case analysis above has illustrated that the actors in the policy deliberation on embryonic genome editing did not give much priority to

procedural strictness, as the member I interviewed complained. In addition, interviews with civil servants indicated that such dismissal of procedural strictness could also be seen in everyday communication in the Japanese policy arena.

It should be noted, however, that this disregard for procedural rigidity does not mean that they go ahead with policymaking haphazardly. We have seen a performative process of secretariats for securing the legitimacy of the advisory committee to those outside. In the interview with the secretariat, they explained how they move forward with the 'process' of policy deliberation in the advisory committees:

> (Interviewee)
> I think *we ought to follow the process to secure that the conclusion is not twisted by the official*. You don't finish your work like "we officials have heard from each of them and put it together into the report here, that's it", do you? First, we made a preliminary outline based on the members' opinions; next, we fleshed out the outline; then, we made an interim draft summary of the report; after that, we made a draft of the final report... *We follow such a process to carefully confirm with those participating in the discussions that there is no bend in a story, nothing that was never discussed in the panel so that officials could not conveniently cut and paste each opinion and argument*. I suppose the Council system ought to be operated in such a way. [...] That's a basic mechanism, and if it is correctly operated, I think that, in principle, your concern should be cleared to a large extent.
>
> (Interviewer)
> Your mentioning 'process' sounds interesting. Your referring sounds include a negotiation aspect to gain others' understanding, but it's a bit different from preparing a format, strict procedure, or something set in advance. Is the 'process' you mentioned something pre-set?
>
> (Interviewee)
> *Nah, it's not fixed at all. You know, it's vaguely organised based on a sort of sensibility we've somehow developed based on the experience so far*.
> (Interview with MEXT official with experience in committee administration)

In their explanation of their strategical approach, we could nevertheless find their adherence to output legitimacy: whether their conclusive decision could gain the understanding of advisory members. On the other hand, such output-

oriented motivation does not allow them to write each action down to any pre-set procedure rules. Therefore, the tactics and process of going ahead with the policy decision could be tacit and informal and then even be attributed to the individual policy actors' sense and skills. This process, which is different from either a procedural series of actions or an unsystematic try-and-error policymaking, could be of interest. I will look into this in the next chapter by comparing it with the UK's somewhat performative engagement.

Additionally, I would like to put an optimistic argument regarding this gloomy environment surrounding the Imagined Publics, for the discussion chapter. As widely argued, imaginary is plastic and can certainly be transformed through active intervention. Indeed, after the introduction of the engagement with the patient groups, the Chair clearly changed her mind about the policy debate and insisted it should be more open to those without particular academic or professional expertise. Also, the civil servant who explained the infallibility of bureaucracy was nevertheless trying to break it down, inspired by his experience of communication with those outside the policy realm:

> (Interviewer)
> When I was doing interviews, I heard many times that civil servants have to be responsible and have to be right.
>
> (Interviewee)
> That's true. But, I suppose that depends on the infallibility of the government that they don't or mustn't make mistakes. But that's just an anachronism, isn't it? With a limited number of staff, could you deal with everything? Now, you're not in a situation where all information doesn't automatically gather around you, nor where you can analyse them as you want. Even in that situation, you cannot make any mistakes. It's impossible. *Instead, if you're in such a situation, you have to go out and gather information by yourselves. If you really want to do the right thing, you have to put more resources into activities like gathering ideas and discussing with others.* Otherwise, you'd go to a dead end. Well, some might feel satisfied to look big, saying, 'We are infallible', but I don't think it would lead to any positive future for the country.
> (Interview with MEXT official who led the stakeholder-engagement project, emphasis added)

If the imaginary theories are well established, as argued, such tiny activities and motivations can be a trigger to change the imaginary widespread in society. I would like to note their struggles here so that they will not be stopgap activities.

Chapter 6: Comparison of the Imagined Publics

The previous two chapters have examined the Imagined Publics in the science policy deliberation regarding similar genetic intervention technologies on human embryos in the UK and Japan. Also, in those chapters, I have outlined several surrounding factors that contributed to constructing the Imagined Publics in these countries. In particular, I have paid special attention to the notion of legitimacy and responsibility embedded in each case, which potentially exert considerable influences on the construction.

In this chapter, I will analyse these findings to answer the research questions based on my hypothetical claim introduced in Chapter 3, through comparative analysis. First, I will compare the elements observed in Britain and Japan, aiming to elucidate the Imagined Publics and the social components that comprise them. Then, I will collate the surrounding factors in each case study.

After comparing the differences in the conception of legitimacy and responsibility between these countries, I will reassess the social recognition of science and technology in each society, or more bluntly, the technocratic conception of science in the UK and Japan. True, the final outcomes of the policy deliberations in both cases are quite similar in terms of their stance, which might seem little meaningful to dig deeper into. However, with the spice of legitimacy, responsibility and the Imagined Publics based on these notions, the social status of science in society could have different tastes, even though they appear similar or identical.

In this comparative analysis, I will also employ data from secondary sources concerning topics other than genetic intervention on human embryos, such as news coverage. Admittedly, this data cannot directly support my

findings in the case study. Nor can the findings drawn from these additional sources be equivalent to the observations in the case analysis in terms of depth in consideration of background contexts. Still, suppose the findings from the same cultural backgrounds but different scientific or policy contexts are in line with the observations in the case analysis. In that case, they have a considerable potential to strengthen the arguments derived from the case analysis. Such observations in different contexts in terms of science can enhance the expansion and generalisation of my arguments into theory by literal replication logic, even though they do not contribute to a statistical generalisation. Particularly, given that the Japanese cultural background is not commpnly represented in STS scholarship, which has been predominantly established in the Western context, such introductions could effectively defend my findings in the Japanese context against criticisms that they are merely peculiar, case-specific observations that cannot be generalised in the culture-wide scale, clarifying the specific perspective of the thesis that differs from previous STS literature (e.g., de Saille, 2015; Jasanoff, 2005c; Rommetveit & Wynne, 2017). Therefore, I will adopt several specimens that support my arguments while carefully avoiding the scattered introduction of miscellaneous examples.

6.1. Differences in Imagined Publics

In Chapters 4 and 5, I have described the Imagined Publics embedded in policy deliberations in two UK and Japan case studies. These were not just prejudice or imagination but rather functioned as the normative, legitimate status of the people in the policymaking practices. Here, I would like to briefly review the features of each for comparative purposes.

Britain: Colleagues as Beneficiaries/Evaluators Who Are Apart from the Issue

As outlined in Chapter 4, the policy discourse on UK mitochondrial replacement techniques encompassed two distinct Imagined Publics. The first,

denoted as *colleagues as beneficiaries*, was prominently featured in the policy documents and other narratives that accentuated the technology's positive impacts, mainly provided by proponents or advisors. This imaginary was nearly indistinguishable from the families of the patients with mitochondrial diseases, which helped others have emotional compassions that urged them to have a moral responsibility to help them. Notably, this distinct ethical commitment could have been regarded equivalently to, or even higher than, other ethical concerns regarding embryonic interventions that could have negative societal ramifications or those stemming from religious convictions, which are difficult to dismiss. Consequently, the ethical commitment surrounding the Imagined Publics as *colleagues* could provide the policy actors' inclinations toward legalisation. In other words, the imaginary here could have functioned as the target of the policy design (Schneider & Ingram, 1997).

The second, articulated as *evaluators* who are apart from the issue, was particularly remarkable in the public engagement and other review processes , suggesting a more general imaginary of citizens shared around the UK policy arena. In these processes, the publics were, at least in principle, treated as crucial informants for decision-making. Therefore, ordinary citizens in that circumstance were justifiably invited to the process to express their views on the use of technology. However, the venue for them was rather separated, and the information flow from and to the space was controlled. For discussion and consideration, the workshop participants were provided input from scientific experts, ethicists, and patients. On the other hand, communication was one-way, and change in the thoughts of informants by the communication with lay participants was not fully considered. The engagement process was constructed with a particular purpose: finding the views of those outside the very issue. As a result, the engagement process was mixed with the place to receive an people's endorsement of the technology.

This separation of the Imagined Publics between particular stakeholders and the rest was materialised in the policymaking activities as a purpose of each event. Those groups of people, outlined by the imaginary, were given the opportunity to express their voices as input for subsequent decision-making. On the other hand, each activity was tailor-made for the targeted group, and the outcomes were tactically conveyed to the next step, according to the *legitimate* policymaking procedure, which I will describe later in this chapter.

Japan: Ignorant Followers

How were the Imagined Publics constructed in Japan? In the case of the debate on genome editing in CSTI, which I described in Chapter 5, we have consistently observed the Imagined Publics as *ignorant followers*. Citizens were never imagined as ones with scientific expertise and, thus, were not recognised as eligible for participation in decision-making processes. This imaginary could be observed in the very design of a deliberation process, which did not, unlike the UK, carry out public engagement exercises or provide other venues for ordinary people to voice their views, as well as the Expert Panel members' reluctance to involve ordinary people or develop discussions on '*unproductive*' topics regarding social views on scientific issues. Such an attitude was consistent with previous studies regarding how experts in regenerative medicine in Japan view science communication (Shineha et al., 2017). The fact that a trial of invitation of laypeople by the chair with the intention of involvement did not continue after her retirement can provide us with the foundation for calling it an imaginary, which is shared in society and relatively resistant in the short term to intentional actions that try to change it. Such an imaginary was not solely or coercively constructed. As observed in arguments at meetings, this imaginary was rather quite correlative or relative in terms that it, in turn, even highlighted the imaginary of experts and civil servants as *authoritative* policy actors in the centre of the policy arena. The hierarchical relationship among different actors is another feature of the Japanese Imaginary Publics to note.

At this point, some readers may challenge or criticise my findings, asserting that Imagined Publics as ignorant followers are not unique to Japan and that the neglect of the publics can be observed elsewhere. Admittedly, such ignorance of the publics, accompanied by mentioning the citizen's deficit of technical knowledge, has much in common with the deficit model of understanding of science that has been widely studied. Given that Japan imported the Western democratic policymaking system during the end of the samurai era and the subsequent acute westernisation of the society, others might argue that the overtly demonstrated Japanese imaginary of the publics as ignorant was just another exemplification of it being still behind the current thinking of Western standard, which at least superficially values people's power in democratic decision-making (Bucchi & Trench, 2008).

Nevertheless, for the very reason that such an imaginary the publics was too overtly articulated without hesitation in the Japanese policy arena, I will dare to maintain my argument that distinguish the Imagined Publics there from the notion of the deficit model. The policy actors could not have thoughtlessly described the publics as ignorant and ineligible for participation in such an open way if they recognised that such articulations were socially illegitimate. In other words, there should be some epistemological foundation for them to justifiably recognise in their official stance the publics as ignorant as a matter of course. In addition, we should also note that the policy actors did not totally disregard the people; for example, the representatives asked to establish regulatory frameworks seriously resisted the offer because they worried about people's reactions to the frameworks. This indicates that these policy actors actively employed the Imagined Publics in shaping the policy landscape. If so, we should take a step further to consider how such an image of ignorance is constructed before accusing them of thoughtlessness in their remarks. Therefore, I will adopt another explanation for their frank articulation of the publics, recognising it as a feature that comes from their conception of legitimacy and responsibility.

6.2. The Differences in Legitimacy and Responsibility

As I described in earlier chapters, the above features of the Imagined Publics in each policy debate and the materialisation of these imaginaries have a correlative relationship with the indigenous recognition of the social, or democratic, legitimacy in policymaking in each country. They are also associated with the underlying preference for the type of responsibility in each society.

Britain: Input Legitimacy – Accountability for the Government Themselves

As previously described, the UK case has seen two different imaginaries surrounding the publics. However, I would argue that these seemingly paradoxical conceptions could be derived from a single notion of social legitimacy.

In the UK case, the notion of legitimacy in decision-making was embedded in the *procedure* leading up to the very decision. It is of note that even though the results were not always satisfactory from their viewpoints, they respected, if not fully accepted, the decisions as long as the process was, in the interviewee's words, 'fair'. To be sure, I am not insisting here that they were satisfied with the results that were against their preferences. Indeed, throughout the interviews, they were certainly unhappy with the substantial outcomes, which means they claimed the lack of output legitimacy. Nevertheless, they used this seemingly conflicting term to evaluate the policymaking processes, which should be worth paying attention to.

Fairness here was ensured by a procedure in which the opportunity for any people to voice their own views was available. Some interviewees, particularly those who supported the use of the technology, were reluctant or unwilling to use the word 'fair'. Instead, they expressed such atmosphere in a humbler way as 'integrity'. Even so, such rephrasing still entails the recognition of procedures as some prerequisites or premises for convincing

results. Such attention to *procedures and methods* could be natural for the fundamental value of the UK or other cultures with Western democracy, which ensure that the members of the democracies have equal, effective input into making collective decisions (Bekkers & Edwards, 2007). The policy designers tried to provide secure spaces for each actor's argument by dissecting each process or activity. In doing so, they could strengthen its legitimacy.

As the original proponent Scharpf recognised, proceduralist pursuit of legitimacy is essential for securing the input legitimacy (Scharpf, 1997a). From his work, we could identify three practical requisites. First, the simple definition of input legitimacy necessitates that the procedure should ensure all possible perspectives have an *equal* opportunity to input for decision-making. However, this immediately raises the second requirement. According to Scharpf, the risk of self-interested or hostile majorities destroying the minority would demand the pursuit of input-oriented legitimacy to fulfil additional procedural equipment in which 'the belief in a 'thick' collective identity can be taken for granted'. Third, and as a general proceduralist precondition, any input needs to be guaranteed with respect to procedural quality. Indeed, the policy actors did not incorporate any opinions haphazardly or ad hoc. They systematically provided a space for voices in their policymaking procedures and tried to take them into consideration in a premeditated operation.

Here, it is not appropriate to hastly conclude that input legitimacy is pursued regardless of output. Needless to say, the quality of input is supposed to improve the plausibility of the output. If poor output can be attributed to the insufficiency or malfunction of the input process, the actions for the decision well deserve criticism. Nevertheless, it should be highlighted that input and output are not always indivisible.

The characters of the Imagined Publics identified in the UK case tie quite well with these preconditions of input legitimacy. First, the publics as *evaluators* could reflect the very initial conception of input-oriented notions of legitimacy that secures equal input from as broad a range of perspectives as possible, if not the full range. Policy actors need a place for justification, and the publics were quite important in procedural respect. On the other hand, the imaginary of publics as *colleagues as beneficiaries* who received special treatment could be attributed to the redistribution of commitment to making the collective character of the publics thicker, which meets the second condition. The ethical commitment of clinical specialists as well as governmental staff was justifiably derived from this recognition. The input-oriented notion of legitimacy could reasonably contribute to the construction of these two split conceptions of the imaginary of the publics.

The third requirement has an affinity with the scientific rigour observed in the case analysis. As the HFEA staff mentioned in the interview, 'a narrow assessment from a scientific and clinical perspective', conducted by the definitive experts in each field, such as developmental biology or clinical genetics with open calls for evidence, was also carefully insulated from other consideration of the technology so that the conclusions could be accepted as results of a rigour procedure of scientific assessments. However, I do not intend to deny or exclude previous critical arguments about expert panels here (Jasanoff, 2005a) because my case study does not eliminate the possibility that they could have also relied on the presence and reputation of each expert member. In this regard, the isolation of scientific assessment could have maximised their influence. Nevertheless, when focusing on legitimacy, we can also infer from the HFEA's careful purification of the Panel's agenda that this separation did intend to meet one-to-one the Panel's goal: 'expert views on the effectiveness and safety' of the technology. More bluntly, the step of the expert assessment was deliberately dissected by policy designers so that different aims would not be contaminated in the process but instead constructed according to the single aim of scientific assessment. In

this sense, the procedural rigour of science, such as peer review practice, made it easy to assess the isolated process of scientific and clinical evaluation according to the aim, which could make the examination of the legitimacy of input more visible to society.

In the development of procedures that secure input legitimacy with the justification sphere, we could observe the *accountability-type* of responsibility in Pellizzoni's terms. As heard in interviews, the policymaking process, which led to the final decision-making, was justified as involving input from every possible perspective. Behind this notion, efforts from different positions were made to secure the legitimacy of the procedure. For example, administrative staff who organised policymaking processes tried to construct procedures that provided all possible viewpoints with the opportunity to voice their opinions. For another instance, policy actors engaged in the process were also sensitive to whether not only their own opinions and evidence but also those from different viewpoints were securely provided in decision-making. Using Pellizzoni's terminology, we could explain that the policy actors tried to ensure that they did everything possible at the time *in order to* secure legitimate policymaking. On the other hand, the attribution of this type of responsibility pertains to *events that have already happened*–the responsibility that underlies such efforts is retrospective in terms that their focus was on what they did beforehand for decision-making. Indeed, such features of responsibility could protect the actors against criticism if the consequent results of the decision have problems, justifying their input process.

The accountability-type responsibility could fit with my findings in the case analysis. According to Pellizzoni, this type of responsibility, which requires explaining what has been done for decision-making for justification, is inseparable from the notion of openness or institutional transparency because it is a core principle of good governance (Pellizzoni, 2004). Such notions well suit the growing complexity of our society with an increasing

contingency of decisions, where policy actors shift the focus of responsibility to rational justification because it might be harsh for them to impose responsibility on themselves based on causal imputation. Indeed, the interviewees used these concepts in demonstrating 'fair play' and 'integrity' in their remarks. In turn, the attention of public scrutiny, crucial for justification, is reasonably paid to the processes as much as, or even more than, the results that come from them. In this regard, it should also be noted that this sort of effort, which was seen in the case, was not always concerned with reaching a conclusion that was satisfactory for all people.

The notion of accountability-type responsibility described above could also provide a foundation for the Imagined Publics as the *evaluators*, in combination with the input-oriented notion of legitimacy. Policy actors must demonstrate that their policy decisions are not made with inadequate input provision, which inevitably entails the assumption of people *to whom* they demonstrate (Warren, 2014). In other words, they could be somewhat self-conscious about their policymaking process, and each component of the policymaking process must have a tinge of performance in the justification arena. In this circumstance, the publics are imagined as the target of the performance whom the policy actors convince of the legitimacy of the procedure. Moreover, the publics are used as the indicator of legitimacy at the same time, so engagement activity was designed to ask about the people's yes-no attitude. These features of the Imagined Publics were detectable in the remark of the HFEA staff highlighting the importance of participatory events with recruited citizens. However, the publics in this context were mobilised to provide the answer to the inquiry rather than to produce more nuanced ideas or knowledges of the technology. People are highly respected as superior informants (at least in appearance) but never acknowledged as colleagues in decision-making, except for particular situations in which they could become *colleagues*.

Now, I compare my findings with the arguments in previous studies on science policy in the country. First, we could argue that the notion of input legitimacy and accountability-type responsibility is highly consistent with the *empiricist* tradition in British political culture, which is accepted in different research works regardless of academic disciplines (Jasanoff, 2005a; Pilgrim, 2014; Smith et al., 2011; Wynne et al., 2001). In particular, British social historian Edward Palmer Thompson (1965) provided in his study of British society a detailed explanation of how 'empirical idiom' has spread among society beyond scientific disciplines and 'for various historical reasons has become a national habit'. Therefore, British empiricism is not just a tendency in the philosophical or scientific field but could be described rather as a shared conception underlying the social imaginary. In turn, this suggests that scientific rigour derived from the empiricist notion of knowledge-making has a substantial affinity with the social conception of legitimacy in this country.

The relationship between the conception of modern empiricist science and people's way of thinking is elaborately analysed by Ezrahi in his book *Imagined Democracies: Necessary Political Fictions* (Ezrahi, 2012). Recognising the authority of lay empiricism and the publics' power in the legitimation of factual claims, he drew 'the association of the real with the visible, the belief in ocular witnessing as the guarantor of factuality' as the primary tendencies of modern commonsense realism, particularly in the Anglo-American context. However, he cautioned readers about attributing this tendency to the progress and dissemination of the Enlightenment or pulling out of prejudices and superstitions. Instead, he argued that the rise of modern science and its empiricist way of knowledge-making influenced people's imaginary of reality via the introduction of 'gestural induction' and 'epistemological literalism', a cluster of orientations and practices that relates to the world as a domain of plain public facts. The prevalence of such empiricist notions in social and political life enabled the emergence of modern imaginaries of social reality, but it was a mere judgement based on probability rather than certainty. Ezrahi further explained that this

commonsense realism laid a foundation for the rise of modern democratic politics by 'materializing' political causalities, events, and agents in the sphere of commonsense perception. He even critically mentioned that the rise of worldly imaginary of the political 'was indispensable in upholding the fiction of popular participation and the visible accountability of democratic governments, despite the paucity of facts that lent it verisimilitude or reality within the domain of modern common experience'. While somewhat harsh, this argument could nevertheless lay a foundation for the democratic legitimation of the incorporation of public perspectives as a resource for decision-making. The metaphorical but nevertheless empiricist conception of modern social reality, in which the publics play a role as witnesses of social reality, provided the social (or democratic) legitimacy for their participation.

Actually, Ezrahi's main focus of interest in the book was not about responsibility, as he noted it aimed at examining 'the particular ways in which modern political imaginaries have framed novel relations between causality, agency, and political order in modern Western societies'. Nevertheless, his descriptions of Western political culture suggest an embedded conception of responsibility surrounding scientific expertise. When it comes to human behaviour, Ezrahi argued that such commonsense categories often confuse causal accounts or descriptions with the attribution or distribution of moral or political responsibility. According to him, this 'tendency to uncritically mix moral attributions of responsibility and scientific, or rather scientistic, attributions of causality' lets indifference to scientific arguments form the basis for blaming decision-makers for taking unreasonable, morally indefensible risks. These articulations of the conceptions of responsibility are in accordance with the observation that the HFEA and other policy actors were serious about securing input from empiricist scientific assessment of the technology.

While there is much complementary between Ezrahi's theoretical work and the UK case study here, it does not devalue the findings that I observed

through the comparison to the Japanese case. Due to his focus on Western political culture, Ezrahi clearly mentioned that he omitted consideration of the difference in the imaginary of reality across cultures while recognising its existence and, therefore, the risk of the indiscriminate generalisation of the conception of commonsense realism. Conversely, his stance suggests that the arguments in his theorisation are quite culture-specific to Western (or, more specifically, Anglo-American) society. In other words, it could all the more emphasise the importance of adherence to the typology of legitimacy and responsibility, which could have the potential of deconstructing the shared conception of democracy. This point will be addressed in more detail in a later section.

The second object of comparison is more from an empirical perspective, focusing on other examinations in this country: dismissals of unruly interventions by uninvited citizens in science policymaking (de Saille, 2015). The authors of the study argued that the imaginary of an 'unruly public' can function within the sociotechnical imaginary to avoid those whose response is unwanted or unpredictable. However, instead of employing the dichotomic assumptions of the elites and publics like de Saille, we can interpret this observation as indicating that the pursuit of procedural legitimacy can result in policy actors readily disregarding the other interventions that deviate from the prescribed methodology. In this respect, it does not matter if such disinvited publics' participation can contribute to improving the quality of the knowledge foundations for policy decisions, as the authors claimed. When unruly interventions happen, the policy circumstances are faced with a sort of difficulty in effectively engaging with such uninvited arguments, as their interventions seldom conform to the procedures that secure input legitimacy. The expectation that unruly intervention could improve output legitimacy cannot make up for their actual undermining of input legitimacy.

To think about this more broadly, it could also be of interest that a recent study on Western democratic legitimacy has focused more on

disclosing these black box processes between input and output and scrutinising them by additional procedures, arguing for 'throughput' legitimacy (Van Meerkerk et al., 2015). This type of legitimacy focuses on accountability, transparency, and openness to civil society (Schmidt, 2010). Such arguments nevertheless adhere to the *accountability* type of responsibility in terms that the scrutiny pays attention to whether the procedure was appropriately (in scrutinisers' views) proceeded (Schmidt, 2012, 2013), and indeed, the proponents of throughput legitimacy use 'procedural legitimacy' as a paraphrase of their concept. However, in reference to the fact that no decision-making process can go through without delegation to policymaking professionals or activities behind the scenes, these arguments could be no more than a variation of input legitimacy in the audit society. Also, the cases show that civil servants or other 'stagehands' exercise their tacit knowledge in such a black box process (Hilgartner, 2000), which suggests that throughput cannot be legitimised externally.

Here, we might want to remember again that the pursuit of procedural rigidity for legitimacy could not always result in satisfaction or, more frankly, output legitimacy (Abels, 2007). Policymaking procedures inevitably entail some activities behind the scenes in a phase where the decision-makers give consideration to different thoughts and arguments as long as there are some delegations of tasks in the process of decision-making. In addition, it is challenging to criticise decision-makers under the circumstances, as the responsibility for the decisions is attributed to the *procedures and methods* for the very decisions. My case study can confirm them and suggest that there is little linear relationship; rather, the responsibility laid under input legitimacy does not pay serious attention to criticism of the decision in a retrospective manner because the result is not linearly connected to the process. Conversely, accountability possesses a forward-looking nature, and thus, the very process for the decision could be and should be continuously revised under this form of responsibility. There is quite a huge gap between input legitimacy and output legitimacy.

Japan: Output Legitimacy – Indigenous Care for the People

In contrast, the Japanese case did not experience such rigid and pre-established procedures for reaching conclusions. As evident in the previous chapter, the deliberation had gone through a literally twist-and-turn trajectory. More brusquely, procedures did not matter for legitimate decisions in the policymaking exercise. The focus of the scrutiny on decisions was *who* was responsible for the policy decision-making and *what* people would think of the result instead of *how* the decisions were to be made. We have seen that the representatives of the academic societies were worried that they would take the brunt of the accusation and criticised that the government had shifted its own responsibility to them. Consequently, the state minister said that the responsibility for policymaking should lie with the government, which is in a guiding position in this country. The procedures for the decisions were provided in a somewhat ad-hoc and plastic manner. Importantly, however, this does not mean that the procedures had some defects or were justified in a post-hoc manner. Instead, they were tailored each time to reach an allowable result or output, just like writing a script for the play so that the story reaches the climax.

And it is here that the Imagined Publics exercise their potential for contributing to legitimacy instead of judging the eligibility for participation. The policy actors around the expert panel anticipated the people's reaction based on their Imagined Publics and produced their outputs so that they would enable the Imagined Publics' satisfaction, just like what Page described the UK civil servants' behaviours based on their Imaginary Ministers (Page, 2012). Their imagination of the people's possible affinity or antipathy reflects their Imagined Publics as ignorant or having a deficit in scientific knowledge.

The atmosphere surrounding the policy discourses, which contrasts with one in the UK, was not unique to the case analysed. The interview with other civil servants in the Japanese ministry in charge of science and

technology revealed that the ad-hoc manner of preparing procedures for decision-making in advance or just neglecting it prevailed widely among science policy in this country in general. The administration instead aimed at reaching conclusions acceptable to those engaged in the process at any cost. *Authoritativeness* is important in this context. The commitment of authoritative entities could assure or convince those outside the policy arena and thus ineligible for taking part in policy deliberation because such entities can take responsibility for those *ordinary* people. This tactic for people's acceptance could reflect the vertical society constructed in the country and is completely different from the perspective of the UK civil servant, who considered that engagement with a limited number of ordinary citizens is nevertheless important for people's understanding of the conclusive decisions. For the British public official, the deliberation involving ordinary people was considered to demonstrate 'to the people who didn't take part that people like them did take part'. We could see here quite a crucial difference in understanding the results as legitimate in these countries. Frankly speaking, Japan's case did not really appreciate the legitimacy of the input part of policymaking like the UK's.

Then, is the Japanese case, which ignores the significance of public engagement as an input process, another example of a deficit model of public understanding of science that pushes aside those without scientific expertise? To consider the question, it could be worth paying special attention to this nuance in responsibility customary in this country. We could remember the Editorial of *Asahi Shimbun's* accusation of the Supreme Court, which I mentioned in the previous chapter. The main target of criticisms in the original Japanese version was the conclusion that the best knowledge at that time nevertheless could not eliminate the possibility of an accident regardless of the exercise of the government's regulatory powers. It clearly recognised that responsibility should lie on the government as an entity *because* they were placed in such a social position, regardless of its capability or knowledge at that moment. It should be important that in these cases, there were intense

demands toward the government to perform an authoritative function in decision-making as their responsibility. Given that these were rather required by those outside the centre of the policy arena, it would be better to recognise these relationships between governmental bodies and those outside the organisations as a sort of social compact instead of unilateral bias by central policy actors.

Notably, these characteristics of social relationships surrounding governmental bodies are quite nation- or culture-specific. The critical argument developed in the Japanese editorial was totally omitted in its English-translated version. The criticism target was shifted to the Supreme Court, which made a wrong (from the editorial's view) decision in their judgement. This modification of the essence of criticism could suggest that the newspaper recognised that such a type of responsibility could not be well appreciated in foreign cultures. With this additional examination of the controversy over scientific uncertainty in Japan, we could argue that the difference in responsibility is not only the case in my thesis but rather commonly embedded between these cultures.

We have categorised this sort of responsibility into the *Care* type, in which responsibility is attributed to the entity which is grounded on a kind of normative and factual belief. The decision-makers have a responsibility *because* they ought to have the best capacity for making decisions beneficial to fellow citizens. Scientific or academic expertise can be a certification for eligibility in decision-making. However, we could see a slight but critical difference from the scientistic override in the decision-making of social issues or notions underlying technological determinism. The authority given to experts here could no longer be connected to the expertise; rather, it is more like a wise men's conference or witenagemot. They are also required to be thoughtful and morally respectable, and even so, they cannot make their own decision and need to rely on those who are supposed to work for citizens: the government.

Conversely, the infinite, limitless responsibility for results made by those authorities, who can disregard the process up to the very results, could, in turn, reflect that unless they make mistakes, their decisions are legitimised without an audit accompanying the decision-making process. This can remind us of the country's vertical concept of 'Okami', in which society delegates a considerable extent of mandate to the administrative staff of governmental bodies, placing them in a higher position within the hierarchical relationship. When making decisions, the decisions could be legitimised for the time being as long as they were made by those *responsible* persons, which is tightly connected to their social authority. This relationship could be more like a contract or a compact in society in terms that it was not coercively imposed by one side, but the other side also expected and counted on. In other words, it may be a bit risky to discuss whether it is good or bad, bracketing this relationship with a conventional unilateral conception of paternalism (Edwards & Wilson, 2012; John & Stoker, 2019). Therefore, this notion of responsibility and legitimacy could enable the open reliance on authoritative entities in decision-making in this country, which could highlight the slight or nuanced, but nevertheless significant difference from the utilisation of such authority in Britain.

The notion of responsibility surrounding decisions can induce some typical behaviours of decision-makers in this country. One particular example is that the Japanese notion of responsibility could lead government officials to be worried about the *infallibility* of decisions among them, as described in the case analysis. When I interviewed a civil servant in MEXT, they explained their colleagues' common concerns about making mistakes:

> (Interviewer)
> When I was doing interviews, I heard many times that civil servants have to be responsible and right.
>
> (Interviewee)
> That's true. But I suppose that depends on the infallibility of the government that they don't

> or mustn't make mistakes. But that's just an anachronism, isn't it? With a limited number of staff, could you deal with everything? Now, you're not in a situation where all information doesn't automatically gather around you, nor where you can analyse them as you want. Even in that situation, you cannot make any mistakes. It's impossible. Instead, if you're in such a situation, you have to go out and gather information by yourselves. If you really want to do the right thing, you have to put more resources into activities like gathering ideas and discussing with others. Otherwise, you'd go to a dead end. Well, some might feel satisfied to look big, saying, 'We are infallible', but I don't think it would lead to any positive future for the country. (Interview with MEXT official who led the stakeholder-engagement project)

The fear of making mistakes or criticisms based on *infallibility*, which can be classified as an extreme subcategory of *care*-type responsibility, is completely different from the *accountability*-type in the UK case in several aspects. First, there is a difference in the driving force and what the force controls or restricts actors. Infallibility concerns future criticism against actors' current decisions retrospectively derived from the future results of the decisions. In other words, it binds actors down by a strong assumption that they *cannot* make mistakes, which deductively controls their current behaviours. By contrast, people who are *accountable* for the policy decisions focus on the feasibility of their current decisions, which can be examined and evaluated even before the results have come. Therefore, the approach could be more inductive in terms that policy actors *must* do what they can do at the moment so that the result will be more satisfactory to citizens. On the other hand, in this situation, future ramifications are not pre-set, and thus, these actions do not need to guarantee the consequence, even though they are required to improve feasibility.

The second feature of difference between accountability and infallibility, which is subsidiary to the first but could be even more important than its superior, is the scrutiny's viewpoint. The accountability regime can logically allow policy actors to acknowledge contingencies as exceptions in their responsibility (even though such a stance is not emotionally or ethically welcomed). As Pellizzoni, the proponent of this typology of responsibility,

mentioned in connection with the history of environmental regulation (Pellizzoni, 2004), this feature could fit in the growing intricacy of situations and weakening causal links between intentions and consequences of action that policy actors face. Indeed, the HFEA staff I interviewed admitted that the methodology adopted at the public engagement project in the policy deliberation on MRT had some to be improved from today's viewpoint. Importantly, he did not mean that they had done something wrong. Accountability can be secured by current actions for decision-making that can improve the plausibility of future results, but what happens in the future is not in the scope of scrutiny. On the other hand, the scrutiny's viewpoint in the infallibility regime stands at the time point when the results of the action happen. The scrutiny can retrospectively investigate the actors' behaviours that lead to the results.

This contrast could facilitate our comprehension of the Imagined Publics in this country. Given the notion of legitimacy and responsibility, the publics are inherently dissimilar to the policy actors and, therefore, cannot be regarded as peers. Furthermore, the publics cannot even be assumed to be *evaluators* who are in superior scrutinising positions to policy actors. There is a clear hierarchical relationship constructed between the citizens and policy actors, which places citizens in the lower position as mere *followers* in the decision-making process. Again, this is not just a tyrannical domination of policy actors, nor mere locking out. The infallible responsibility of the policy actors is on the opposite face of the same coin with the disregard, which could come from different sources than the notion of the level of knowledge (the influence of the notion should not be denied, though). In this regard, we should not emphasise too much the *ignorant* aspect of the Japanese Imagined Publics. It is the notion of legitimacy and responsibility in the cultural context that provides the central pillar of the construction of the Imagined Publics as *followers*.

Comparison: Their Incompatibility

The previous two subsections have seen the characteristics of responsibility and legitimacy. The table below summarises some of the key features.

Table 6.1. Summary of Findings in the Case Study

UK		Japan
• Colleagues as beneficiaries • Evaluators who are apart from the issue	Imagined Publics	• Ignorant followers
Input • Empiricist tradition • Proceduralism	Legitimacy	Output • Okami tradition • Authority as a legitimate entity
Accountability • Lies in action • Can be fulfilled independently from output in principle	Responsibility	Care (Infallibility) • Lies in entity • Limitless criticism in bad output

One thing to note is that societies under different types of legitimacy and responsibility can recognise public engagement differently. In the previous chapter, I quoted the Japanese civil servant's comment on the people's resistance against the lockdown for measurement against the COVID-19 pandemic that happened in Western countries. They were concerned that people would not be able to take responsibility for the decision. With the conception of care-type responsibility, they considered the publics incapable of taking the initiative in decision-making. Another Japanese interviewee also mentioned that public engagement may fall into just a 'ガス抜き (letting steam off)' activity. It suggests that a society which prioritises output legitimacy can consider actions for input legitimacy as even more formalistic and superficial, which is in accordance with the difficulty of spreading a conception across cultures (Macnaghten et al., 2014).

Another thing to be confirmed is that the features were not mutually exclusive. They could, to some extent, be observed in the other culture or gain

the sympathy of the opposite counterpart. In other words, I am not insisting here that the UK will even accept terrible output as long as the procedure to reach the output is well organised. Nor am I criticising that the Japanese policymaking customs completely ignore procedural rules. Nevertheless, there was a clear contrast between the two in how much the practices put stress on both types of legitimacy, which could also be in line with the political sciences (Bühlmann & Kriesi, 2013).

6.3. Science Embedded in Each Legitimacy Scheme

Now, as an novice STS researcher, I would go back to consider science embedded in these cultures in more detail. True, earlier studies have elaborated on the social perceptions of science in both countries. However, given the social and political differences surrounding legitimacy and responsibility described above, I believe I could introduce another perspective in the lineage of studies on the social imaginaries surrounding science.

Science: How Does It Improve the Legitimacy of Decision-making, or Obtain Its Own Legitimacy in Decision-making?

Certainly, scientific (including 'clinical' in this study) knowledge played notable roles in both cases. Scientific expertise, in these contexts, was a useful tool for the policy actors to help them improve the legitimacy of the arguments or decisions made by them. However, considering the difference in reasoning based on legitimacy in each culture, we could distinguish the significance of science between Britain and Japan.

I do not arrogantly aspire here to establish some conception more advanced than the sociotechnical imaginaries. Borrowing many conceptions from its definition, the scope of the following description could be even narrower than the original idea of sociotechnical imaginaries. Indeed, my interest is particularly focused on the relationship between the imaginary of scientific expertise and one of the publics, on the different foundations of

social or democratic legitimacy in decision-making and the associated responsibility of policy actors. However, in what follows, I will explain that the difference in the type of legitimacy emphasised in a given society could influence how scientific expertise and scientists occupy an authoritative status with legitimacy in the policymaking practice.

In brief, the routes are totally opposite. The UK sees that scientific knowledge-making practice that follows the indigenous legitimation custom can grant logical legitimacy, or input legitimacy, to the expertise produced through the practice and, eventually, those who have the expertise. In Japan, on the other hand, the prospect of offering a promising future, i.e., output legitimacy, could provide an authoritative position on the experts and legitimate the expertise they offer in the arguments, regardless of their rigour in knowledge development. While seemingly trivial, I believe this difference in the route of legitimation observed in the comparative analysis could provide some fruitful implications.

Britain: Rigorous Input that Also Enhances Plausibility

Previously, I introduced Ezrahi's description of the influence of the empiricist conception of science in the construction of the modern democratic imaginary of social reality. Given that the social imaginary is a reflexive conception, it could be important to think about the contemporary imaginary of science embedded in this case, with the conception of legitimacy and responsibility.

As articulated earlier, science was isolated from any other arguments in the UK's case. The scientific considerations given by the Panel were separated from other activities of policymaking and were carefully constructed among the scientific advisors and supporting secretariats. It was 'a narrow assessment from a scientific and clinical perspective', as an HFEA staff marked, which could secure the sovereignty of their own discipline.

Why was this separation important in this context? From the viewpoint of legitimacy, the isolation of science could improve input legitimacy in two ways. First, as described earlier, it could have helped to demonstrate that each activity met an aim without contamination, so that it is clear what is inputted. The isolation was suitable for examining whether a space was appropriately provided for good input from the scientific perspective. This reductionist approach in the design of policymaking processes could fit the conception of input legitimacy in that each component of the input can be easily assessed one-to-one. Second, given Ezrahi's explanation of the historical context behind the policy culture, input legitimacy can also be secured due to the very conception of science. Following the quote above, the HFEA official also mentioned, 'It might be a responsible thing to consider this new treatment as being a safe action or not'. Considering the conception of British legitimacy and surrounding responsibility, which was considerably influenced by the conception of modern science, the procedural rigour of scientific knowledge claims was suitable to demonstrate that they had considered safety in a technically rigorous way. Focusing on the technical possibility of undesirable effects caused by the utilisation of the technology, they considered that such assessment could be important for policymaking processes to be '*responsible*'. The science here could be regarded as a procedurally rigorous activity of knowledge-making that ensures the legitimacy of the empiricist public action, and it was quite beneficial for them to be *accountable for the policymaking process*.

We already know how people recognise new technologies as safe can vary among different people, and thus, some could very well point out the lack of consideration of what 'safe' means in this point (see, for example, Millstone 2009). Also, the technology in question during the policy discourse was still uncertain at that time. Therefore, any scientific expertise was no more than 'serviceable truths' (Jasanoff, 1990). However, the British empiricist culture could have some inclination to validate scientific expertise that adheres to procedural rigidity as objective, value-free claims. As Jung and their

colleagues argued, such objectivity could help resolve the epistemological uncertainty that policy on scientific issues faces by making scientific expertise easier to translate into policy (Jung et al., 2014).

At the same time, we should note that the procedural rigour in the scientific assessment, which contributes to legitimate policymaking, can paradoxically conflict with the very policy decision-making. In the case analysed in the thesis, we observed that scientific assessment continued even after the approval for the use of the MRT in the policy aspect: the Parliamentary votes in both houses. The scientists in the Panel justified this additional scrutiny in the interview, but actually, the government staff noted that there was an inclination to give the green light to the technology without conditions around Whitehall and Westminster. Nevertheless, the officials admitted the extra assessment, even though such adherence to scientific perfectionism could have been an obstacle to the smooth policy implementation. Therefore, we should keep in mind that so-called scientific elites can conflict with policy elites in the social adoption of scientific technology. Policy elites who have relied on scientific rigorousness in legitimising the process of decision-making cannot dismiss their pursuit of rigour, even though it could get in the way of policymaking. In other words, science here did not form a monolithic relationship with policy nor act as a mere 'tap' for the policy elites.

While the case mostly demonstrated the high affinity of the social and political order with the conception of input legitimacy, we should note that it also indicates that scientific expertise is regarded in this country as contributing to the quality of results. This notion was typically implied by the comment of the scientific advisor: 'You have to get the science right first'. The remark assumes scientific knowledge as the background information about our world and as capable of providing plausible predictions even in uncertain situations. At the same time, it also reflects the premise that secure or, more precisely, rigorously examined arguments or theories should be provided

before any further predictions. In other words, the rigorous theorisation that scientific inspections provide could obtain *plausibility* and could be perceived as contributing to satisfactory results from decision-making. Such an empiricist conception in the production of public knowledge and plausibility in speculation even highlights the emphasis on the input stage in policy decision-making.

Japan: Source of Authority that Guarantees Satisfactory Output

As previously mentioned in this chapter, I maintain that the publics' level of scientific knowledge does not determine the Imagined Publics in Japan, but I do not intend here that science is completely irrelevant to the construction of such an imaginary or an imaginary of the other policy players. Indeed, the Japanese controversy over embryonic genome editing, which I analysed in the thesis, also treated scientific expertise as superior to the people's concerns, which were rooted in origins different from scientific knowledge. However, through the lens of legitimacy and responsibility, I will try to distinguish, at least to some extent, this prioritisation of scientific expertise and neglect of the publics from the one seen in the British case.

One of the biggest features was that what was mentioned as scientific knowledge was not seriously examined at the advisor's meeting. In the report, the Panel, as well as TF, did not provide the complete source list or explanations to show what sort of evidence they mobilised to reach the conclusion. Therefore, it was rather difficult for readers to grasp how wide the range of evidence was taken into consideration for constructing the Panel's arguments. For another instance, as a non-scientist member of the TF complained, some verbal opinions voiced at the TF or plenary Panel meetings without reference or factual data were easily accepted as expert evidence. This means that such oral comments were justified simply because they were voiced by *authoritative* specialists. Here, I do not mean to judge whether the contents of their comments were right or wrong. Nor do I want to criticise the specialists' attitudes, arguing that they recklessly imposed

their inclinations. Rather, I would pay attention to the atmosphere surrounding the committees and argue that scientific rigorousness, or more fundamentally speaking, the procedural foundation for legitimising arguments, was not pursued in this situation. Instead, there was another resource that provided a foundation for the legitimacy of the policy decision–that is, *who* made a decisive argument.

Then, how did scientific expertise contribute to the legitimacy of policy decisions? If, unlike in the UK, its procedural rigour does not provide legitimacy, how was scientific knowledge esteemed in the policy deliberations? In this regard, I argue that scientific expertise in the case provided a sort of authority in decision-making with the advisors. More bluntly, the authority did not adhere to *scientific* expertise; any expertise or even the dedication to problem-solving could provide a sort of authority in policymaking processes to an individual entity (or institution). However, we should distinguish this authority that coincides with scientific expertise from other sources of legitimacy that are regarded as outdated in the trajectory of the evolution of Western democracy–such as religious, traditional, ideological, or charismatic premises (Scharpf, 2003). Such expertise or speciality is awarded the authority in consideration of the ability to advance the satisfaction of the publics or enhance the benefit to them–in other words, output legitimacy. For this reason, expertise here can be more or less the same as dedication or commitment to the policymaking activity, in that both can similarly provide authority. This pursuit of output legitimacy, which pays little attention to the trajectory toward the output itself, could slip into the simplification of the imaginary of science as *an easy answer for any complex question* or *a textbook solution that guarantees satisfaction*.

Considering the types of responsibility in the country, we could find a stronger incentive for policy actors to rely on science and the imaginary of science behind it. In the interview, the respondents pointed out the *infallibility* surrounding the country's policy atmosphere. This type of

responsibility imposed on policy actors in this country, especially government staff, would never forgive them for making mistakes, similar to the pressure imposed on a kicker of a penalty shootout. Contrary to the *accountability* type observed in the UK, the *infallibility* type of responsibility could be anticipatory, as this responsibility is attributed to what will happen to society or the people. The policy decision-makers have to make plausible choices beforehand, and if the choice fails to satisfy or benefit the people, the policy actors would be exposed to limitless criticisms regarding the results, regardless of what they did or what they could have done for the decision. To evade such difficult situations, the policy actors deductively depend on feasible predictions, trying to secure output legitimacy. In this point, the modern imaginary of science as a provider of certain answers to inquiries shared among society could facilitate the policy actors using such authoritative scientific expertise to be responsible to their fellow citizens. In turn, the tense circumstances surrounding the responsibility of policy actors could even enhance the modern imaginary of science at the expense of the responsibility shared with the policy actors: the risk of retaliation in case of failure.

This status of scientific expertise in Japan could have several effects on the policymaking that are characteristic of the country. For example, the pursuit of output legitimacy could allow people any discipline or lineage of expertise to be considered in policymaking as long as they are in an authoritative position, as observed in the genome editing case and the COVID-19 Advisory Board that appointed an expert in iPS cell research as a member, both of which I referred in the previous chapter. Furthermore, given that this output-type notion of legitimacy is provided by the care-type of responsibility and that the responsibility is attributed to an entity rather than an action, we could argue the superiority of science can be easily collapsed if another authoritative entity takes responsibility for the decision. Indeed, in the case of Japan, scientists on the Panel were not always in a superior position. Rather, other specialists, as well as secretariats, sometimes

led the discussion to their own preference. These findings contrasted with 'the scientific imperative' in the UK interviewee's words: the sovereignty of science that can be free from interference in the policy arena.

In a sense, we could interpret that this sort of tolerance could contribute to the decision-making on multi-disciplinary or interdisciplinary topics. On the other hand, people pay little attention to securing scientific rigour in the arguments because any argument by experts could be allowed in policy deliberations once they obtain certain authority in society. However, it needs to be distinguished from the autocratic dominance in society. It should be attributed to the notion of responsibility for the results that come from decisions, which prevails in this country. This responsibility must be fulfilled at any cost, and in this sense, the imaginary of scientific knowledge *as feasible textbook answers* could be quite useful for taking responsibility.

Comparison: Analogous Appearance from Different Roots

I do not intend to argue that the features of the imaginaries surrounding science between the two countries are completely different. Indeed, the notion of *plausibility* in the UK and *feasibility* in Japan could originate in the similar, if not the same, perceptions of science. However, considering the difference in the conception of legitimacy and responsibility between these countries, they are outwardly similar but nevertheless have differences, just like a bird's wing and a bat's wing.

Let me take the blind reliance on scientific expertise provided by scientists, as observed in the Japanese case, as an example. As Churchill famously explained, the instrumentalist attribution of science as 'on tap' for the policy decision-makers has also been commonly observed in the UK. The empiricist tradition in this country depends on past experiences. As Ezrahi mentioned, they refer to previously demonstrated explanations of social reality. However, in the process of selection and adaptation to the commonsense contexts of epistemological literalism and everyday practical

needs, scientific knowledge can be easily fragmented and adopted without considering how the knowledge was constructed. In other words, instrumentalism in this country could be equivalent to simplification and degradation. It should be problematic because this process of simplification for everyday use can damage the source of legitimacy of scientific knowledge. For this reason, such degenerated instrumentalist utilisation of scientific knowledge all the more deserves criticism for losing their accountability of securing input legitimacy.

However, the reliance on scientific knowledge in Japan reflects a different aspect. In a society where conclusive arguments and decision-making derived from them can obtain authority in exchange for responsibility for their certainty and consequences, people do not seriously care where the expertise comes from or how it was constructed. Therefore, simplification could be rather justifiably, if not welcomingly, adapted for streamlining decision-making. It could be a sort of delegation where people leave consideration to scientific knowledge-making, but it is not cost-free–they would deserve retribution for this exercise of mandate. Therefore, it is not appropriate to employ the same logic for criticism in these situations.

Scientists (Experts): How Do They Provide Expertise in the Policy Arena?

In the previous section, I considered how science is situated in each society. Now, I will shift the focus to scientists in the Panel, who are supposed to be appointed based on their scientific expertise. In this regard, it could perhaps be better to use the term *experts* instead of scientists. Considering that the cases concerned specialists and knowledges from non-natural science fields, this term will fit better in the following examinations. Then, how is their authority situated in the policy arena? Tightly connected with the notion of science, the status of the scientists as perceived by other people as well as themselves looks different between these two cases.

Britain: Sovereign Owners of the World of Science

As in the interview with the scientific advisors, we have seen that policy actors surrounding advisory committees tried to secure scientific sovereignty. They made arguments sticking to their own expert fields, in which they were confident. The separation of fields, achieved by boundary work and subsequent division of labour, could make it easy to assess each field. It might sound like an old maxim: 'Every man knows his own business best'. In other words, scientists (and also other players) could be in an absolute position in their own territory.

However, the science policy arena is not a monopolised area for scientists. There are, without doubt, input routes for other argumentations or knowledges. Then, the input phase could entail some sort of disagreement among different argumentations, which was also clearly demonstrated in the case analysis. In addition, policymaking processes involve activities after the input, where the government or elected politicians need to consider all inputs for constructing the output(s). In this regard, we can easily remember Hilgartner's notion of *the activities behind the scenes* (Hilgartner, 2000). Such separation driven by the conception of input legitimacy could make it even more difficult to reach a conclusive decision-making phase because each side brought by the separation argues for the legitimacy of their input until the decision-making moment.

In this regard, the interviewee's remark about the 'scientific imperative' is quite worth considering. The representative of religious groups tried to deliver their voice, and indeed, they had communicated with the government staff in an open arena, but their opinions were not embraced in the end. It could suggest that negotiation among different opinions and knowledges in the country's policy arena can be more like a turf war, in which each group try to expand their territory as large as possible. Their expression of 'scientific imperative' could be all the more important because it suggests

that they were concerned their territory was subjected to the risk of being dominated by the region of science in the negotiation.

Here, we could provide several clues to understand the factors behind the dominance of science policy by arguments from scientists. First, this sense of dominance should be derived from scientistic prioritisation, which is already articulated in the previous section. It could also be in line with previous studies. In her study of 'civic epistemology', Jasanoff (2005) noted that the UK expert panel is assumed to be the place of 'consultation among persons whose capacity to discern the truth is regarded as privileged', which could produce 'objective knowledge'.

Jasanoff further pointed out that it depends on 'the excellence of each individual's personal discernment—the capacity to see the distinctions that matter'. With this respect, it could also be interesting that several advisors recognised themselves as having more than one perspective of science, such as policy or patients. In the interview with scientific advisors, a biologist mentioned that they could 'speak the language of the HFEA as well as speak the language of science' and also noted that the HFEA could have shared the same impression with them. It could suggest that the advisors can be more like translators who stand on the boundary between science, on the one hand, and policy or society, on the other. They could be regarded as bridging different fields, which helps policy actors build up scientific advice that had already been exposed to some sort of negotiations and compromises. This could have more affinity to different opinions than purified arguments. In other words, while arguments officially need to be purified and subject to open negotiation and compromise in the political process, the opinions could be expected to blur their boundary in practical circumstances.

There is another, or the second, explanation for this characteristic of the imaginary of scientists in this country, which is not so well described in

previous studies, but I will address this later in this section, in comparison with the one in Japan.

Japan: Any Knowledge Can Be Welcomed As Long As It Is Authoritative

Then, let me move to the consideration of experts in advisory committees in Japan. According to the verbatim proceedings of the Panel meetings, the experts did not always stick to their position as experts. When rulemaking for regulation was necessary, they performed as 'civil servants', and when social acceptance or impression was at stake, they impersonated 'the public'. Contrary to those in the UK case, such behaviours of the Panel members suggest that their self-recognitions are no longer pivoted on their own expertise.

This jumbled self-recognition of the Panel members, as well as governmental policy actors in the policy arena, could all the more demonstrate that the responsibility and the power for decision-making were inseparable. While legally prescribed as advisory committee members, the Panel members did not regard themselves as independent from the government but rather as almost identical to it, having the supreme responsibility for the decision-making. Moreover, the controversy in the early phase around the Panel had seen several shifts of responsibility. It was first proposed by a secretariat of the Panel, who delegated the authority in decision-making to the Panel members. However, when faced with moral issues, the Panel hesitated to take responsibility in decision-making, and then they turned to the academic societies for their initiative, arguing the societies knew better about the actual social circumstances surrounding the technology. On the other hand, little communication between the secretariat and the societies forced the representatives to express a rather harsh refusal of collaboration due to a fear of taking all responsibility and bearing all the blunt possible criticisms. Given that the then minister finally declared the government to be in a leading position of policymaking with responsibility, holding initiative in decision-making was indivisible with the responsibility

and the authority concomitant with it. Bluntly speaking, the level of knowledge was just an excuse.

By taking responsibility for the decisions they have made, experts can enjoy an authoritative status. In this conception, the field of their expertise does not crucially determine their status but is important for the amount of responsibility they could take. Scientific expertise could provide confidence in taking responsibility for the resulting decisions because it could help the speculations or inferences of the outcome of the decision to be more probable. In this sense, the confidence could come from the empirical recognition of science, which has an affinity with its perception in Western culture. On the other hand, the policy culture, which prioritises output legitimacy, just welcomes this in terms of instrumentalist means, which contribute to the feasibility or sense of output legitimacy, regardless of how they function. However, how can the policy actors outside the scientific school evaluate the expertise? In this situation, expertise could be easily muddled with excellence in the professional field, on which the government counts because they cannot evaluate the expertise in the same manner as how their peers do. Then, how has the excellence been established? The accumulation of expertise or achievements, or the political efforts inside the scholarship? The answer could be yes to all–any contributions could be accepted as long as they can be exchanged with the responsibility for the results. Metaphorically speaking, authority and responsibility here could be like transactions in a stock market. People purchase authority as a passport to enter the policy arena at the expense of social tokens (academic excellence, achievement, political presence, etc.). Authority is a sort of negotiable instrument combined with the risk of responsibility for the result. The transaction can happen like margin trading; People can obtain more authority than they themselves can normally afford, but if trouble happens, they would be charged what they deserve, that is, the blame for the trouble.

Again, an important thing here is that the authority in decision-making is provided in exchange for taking the risk of responsibility. If the decision came to be a failure, policy actors would be subject to limitless criticism and lose credibility. In this regard, the relationship between authority in the policy arena and responsibility here could be similar to the leverage in stock trading. The policy actors buy the authoritative status at the cost of responsibility. Responsibility could accept any currency; expertise from any academic field or even dedication could be exchanged with the responsibility. Considering the observed passive ping-pong rally of responsibility between academic communities, the Panel, and the government, we might want to argue that the delegation of decision-making in the country could be more than the paternalistic guidance of innocent fellows by those with authority. It is more like an abdication of responsibility, which can be justified from both sides as a form of social compacts or deals.

In addition, this articulation does not discredit the commitment of policy actors to the decision-making. Many of them would enter the locus of policy deliberation with preparedness for the responsibility. However, this sense of leverage might sometimes allow them to consider themselves more than their actual capacity. It could be compared to credit transactions; responsibility plays a role as security for more authority than their possessions. This invasion of other fields of knowledge or dominance in the policy arena could be different from the scientistic legitimation of science in the policy arena.

Comparison: Where does its authority come from, and how does the origin have influence?

Again, at this point, most readers may question my distinction, arguing that previous studies have pointed out the status of experts in the UK that are quite similar to the one of Japanese. Certainly, the report by the HFEA clearly stated that the Panel members were the country's leading scientists who had certain authority. Also, Jasanoff (2005) noted that '*British expertise*

remains tied to the person of the individual expert, who achieves standing not only through knowledge and competence but *through a demonstrated record of service to society*. It is as if the expert's function is to discern the public's needs and to define the public good as much as it is to provide appropriate technical knowledge and skills for resolving the matter at hand' (emphasis added). She also mentioned that '[t]hough British expert advisers can and do represent social interests to some extent, *ultimately it is the excellence of each individual's personal discernment—the capacity to see the distinctions that matter—that ensures something recognized as objectivity. Needless to say, this faith in expert discernment could hardly exist in a cultural context where common norms of seeing and believing were felt to be lacking, as in the United States*'. These explanations mean that the experts in the UK could be more than just advisors, and there is trust in expert judgements attributed to individual excellence rather than their scientific expertise. This seems to be in accordance with what is observed in the Japanese case, where expert members of the advisory panel obtain somewhat blind authority.

Nevertheless, I would keep taking a stand against the argument that mixes up the imaginaries of the expert between two countries by paying attention to the notion of legitimacy. In the same book, the author clearly described the feature of British policy culture as 'a pragmatic, empirical orientation, producing scepticism about claims that appear to go beyond the observable facts of nature or society'. She also mentioned that 'once the science became reasonably secure, as, for instance, with respect to tobacco smoking, ozone depletion, or climate change, British policymaking did not generate the persistent controversies that plagued regulatory science in the United States'. The policy culture here is in line with the conception of input legitimacy, in which the procedure for confirming verifiability is crucial for the justification of the input. Indeed, as the phrase 'record of service to society' suggests, the experts' authoritative status comes from empirical accumulations of experience, including outside the lab. Therefore, the authoritative status of experts in Britain stresses the input side of legitimacy

to a considerable extent compared to one in Japan. In other words, her articulations suggest that dependence on experts in both countries is derived from different conceptions of legitimacy and the associated imaginaries of experts.

News coverage of scientific advice on the pandemic also supports these findings. More than one newspaper disclosed the conversation in an unofficial meeting of the COVID-19 advisory panel to the Japanese government[44]. The chair proposed to make a strong and single recommendation for the infection measure, taking a step further from just showing the options and letting the government make a decision from the provided choices. When faced with objections by other panel members, the chair, as a contact person to the government, explained that 'We can't get the government's understanding by simply presenting the options'. The remark further sparked a heated debate that lasted until late at night. In this regard, the government did not expect the panel to perform as an 'honest broker' in Pielke's terminology. They wanted the panel to provide a feasible answer while taking responsibility for the proposal. This communication in the panel and the panel's attitude led by the chair was exposed to criticism from a wide range of academism (Yonemura, 2020), which I will address in the next chapter for deeper discussion.

6.4. Imaginaries Materialised: The Role of Administrative Staff

While this chapter has illuminated the contrasts between the UK and Japan, the comparative case study also revealed a commonality between the two cases: the significance of administrative staff in the materialisation of imaginaries. In each policy deliberation, the policymaking processes were

[44] 「選択肢出すだけでは意味がない」尾身氏提案に揺れた専門家組織 ('Just presenting choices makes no sense'–Expert Panel upsets by Chair Omi's proposal). (2022, May 1). *Mainichi Shimbun* (Japanese). https://mainichi.jp/articles/20220430/k00/00m/040/231000c; COVID-19 panel fails to reach consensus ahead of holidays. (2022. April 28). *The Asahi Shimbun*. https://www.asahi.com/ajw/articles/14609779

designed and constructed by administrative staff or civil servants. Even with pre-designed standard operating procedures or oversight systems, administrators did have a considerable amount of discretion over their work. Their works reflected the imaginaries of the publics, science and administrative staff themselves. This suggests that civil servants played a significant role in allocating resources to each part or step of the process. However, this does not simply mean that they intentionally bent the policymaking process as they wanted. Shared imaginaries and underlying notions of legitimacy and responsibility regulate their actions.

Nevertheless, such commonality in the civil servants' involvement could even highlight the difference in the relations around them. In the UK, the official status of administrative staff as stagehands could obscure their inevitable commitment behind the scenes. Despite this, they engaged in or even tried to control the policies within their jurisdictions, that is, shaping the policymaking procedures. This involvement, which determines who else would get engaged in the processes and how, ultimately influenced policy direction. In contrast, the Japanese case has seen more direct, open intervention of civil servants in policymaking deliberations. The Okami structure and perception of infallibility could push them to step onto the stage instead of being stagehands. The differences in civil servants' mandate could align with the difference in the shared notion of legitimacy in each country.

In this regard, it should be interesting to refer to McNollgast's theorisation on bureaucracy's control (Mccubbins et al., 1987). Focusing on the Agency's governance by Congress in the US, they argued that administrative procedures could function as instruments of *ex-ante* control of bureaucracy. As a practical matter, the elected politicians have to delegate considerable policymaking authority to administrative agency staff. In this situation, they pointed out that ex-post scrutiny mechanisms such as legislative oversight and judicial review do not efficiently work for control. Instead, they claimed the administrative procedures enacted by Congress

could dictate the daily actions of civil servants, enabling democratic governance in policymaking and implementation. This conception seems to be in accordance with the findings in the UK case but not so strong in Japan, where policymaking processes are 'vaguely organised based on a sort of sensibility' developed by civil servants through their careers, as noted by an interviewee. Also, it is somewhat obvious that civil servants are not fully under democratic control, as the paper describes.

The findings in this thesis could provide an explanation for these discordances. First, the conception of the McNollgast group also relies on procedural legitimacy focusing on the input phase, which democracies in Western communities commonly share. Therefore, it may not always apply to regimes with different types of legitimacy, such as Japan. Second, administrative procedures are merely one of the manifestations of input legitimacy, which underlie the standard of the civil servants' behaviours. As the case study suggests, the civil servants' daily activities behind the scenes as policymaking practices could be beyond such procedural control. Nevertheless, they do not act as they want; rather, they are regulated by the country's conception of legitimacy.

6.5. Chapter Postscript: The Influence of the Difference in Reasoning

With a series of twists and turns, this chapter has investigated the cases in the UK and Japan in a comparative manner to answer the thesis's research questions. First, the chapter elucidated subtle but significant differences in the Imagined Publics, attributing them to the difference in the conceptions of legitimacy and accompanying responsibility. By introducing distinctions in these conceptions, the chapter attempted to uncover differences in other imaginaries in science policy, such as science or scientists. These differences, observed in the case analysis, appear consistent with the contrasts in legitimacy and responsibility I proposed. These accomplishments

could provide a foundation for demonstrating my hypothetical claim as promising in a critical realist manner.

Some might perceive the analytical effort made in this chapter as nit-picking. Others might cast a question: if the outcomes, such as the resulting imaginaries of experts shared in society or the empirical commitment of civil servants, are more or less similar, does this difference in the conception of legitimacy really matter in practical terms? Certainly, the visible consequences of both cases are largely similar; both have similarly resulted in the approval of the use of technology with little attention to the public views and concerns about the very technology during the policymaking processes. The impression toward and reliance on experts were not contrasting either, as they obtained authority due to their individual excellence or celebrity. Science, in these cases, was applied in a more instrumentalist way to persuade those outside the professional community among scientists. Therefore, it is surely no wonder to attribute these similarities to the same conceptions.

Nevertheless, the presented differences between the two countries could demonstrate that this is not mere sophistry. Even though they could share both input and output-oriented notions of legitimacy, we could detect contrasts in the emphasis on them between Britain and Japan. This dissimilarity could enable us to explain the faint, nuanced features of conceptions of science and experts, crucial actors in science policymaking. Furthermore, this difference could become even more pronounced during social crises in which science is crucially entangled, highlighting its invisible significance in actual policymaking.

The comparison of legitimacy could also highlight the contrast in collective reasoning between the UK and Japan. In Britain, each procedure has to be provided in a cautious manner to ensure the final conclusions can be explained as legitimate. There is no pre-set legitimacy, so they need to

exhibit their procedures as a source of justification. On the other hand, once a procedure is legitimately prepared, the conclusion could be regarded as fair. This direction of inference could reflect the empiricist tradition in the country. By contrast, the reasoning process in Japan commences with the premise that experts or government officials possess inherent infallibility, meaning they can and should (or even must) make reasonable decisions because they know more than others and are better at dealing with issues. Legitimacy here can be presumed a priori, and any procedures for decision-making can be in place as long as they do not undermine the legitimacy bestowed upon the decision-makers.

Consider the contrasting attitudes of the people toward scientists observed in the Wellcome Global Report, introduced in the introduction chapter. Now, we can interpret the distinctive feature seen in Japan as exemplifying that the result is crucial for reliability, which denotes that the output-oriented type is the dominant notion in their legitimacy. In addition, in a society where people obey Okami, there is a correlative relation between self-perception of understanding science and a decrease in trust in scientists. This also suggests that the government's tendency to follow the experts' suggestions does not come from trust or understanding of expertise. Instead, it could strengthen the argument that this inclination arises from a contract-like relationship that requires output legitimacy as the expert's responsibility. In turn, these completely opposite results between the UK and Japan could be understood that the reliance on individual excellence or celebrity of scientists in the UK is, unlike in Japan, not so much legitimised at the cost of the risk of retaliation in case of failure.

The focus on the difference in thinking between the West and East, especially East Asia, is not brand new. Various lineages of scholarship, ranging from cognitive science (Lee et al., 2006) to communication studies (Min, 2009), have approached this even after Nisbett organised the features and their background in his book *The Geography of Thought* (2003). These

studies, which focus on individuals' way of inference, dating back to some ancient way of thinking such as Confucianism or ancient Greek philosophy, could be crucial for comprehending how these different approaches in reasoning have emerged, grown, and prevailed in the communities. Nisbett's dichotomic notion between East Asian reasoning as holistic and dialectical and Western as analytical and logical may have both similarities and disagreements with my arguments drawn from the case studies. However, since studies in this field are ongoing and still controversial, progress on this issue is expected in the future. I would like to leave it to other studies to determine general features in the way of thinking in both countries and instead pay more attention to the influence of these differences, which is addressed in the next chapter.

Chapter 7: Discussion and Conclusion

The thesis has examined social conceptions surrounding science and policy through the comparative analysis of the science-policy deliberations in the UK and Japan. It was not an inductive approach in terms that the analysis was exploratory, but neither was it deductive because the study did not evaluate an existing theory. It followed an abductive approach in the analysis and thus assessed the case to examine whether the hypothetical claims could explain what happened in the policy act. Therefore, I will begin the final chapter with a brief summary of the findings for assessing the initial hypothetical claims.

While seemingly experiencing twists and turns, the thesis has consistently put its focus primarily on the power and potential of PEST. As mentioned in earlier chapters, the existing STS literature, which has highlighted cultural differences behind science and technology, has nevertheless been trapped in the cultural premise regarding democratic governance, particularly its inherent assumption regarding legitimacy and responsibility. I argued that this could risk eventually obscuring how expertise in science and technology, or those who have the expertise, are situated in science policy practice. In what follows, I will demonstrate this concern hits the point, or more ambitiously, will attempt to deconstruct the conception of democratic governance of science and technology by considering the Imagined Publics uncovered in the policy discourse case studies in the UK and Japan.

Then, I will move on to some speculative discussion on public engagement in science and technology. I believe that attention to the Imagined Publics and the legitimacy behind them could have important implications for arguments supporting PEST from a practical perspective.

7.1. The Imagined Publics – Why Do We Construct Them?

Their Existence

Through the comparative case studies, we could confirm the existence of shared imaginaries of the publics, or simply the Imagined Publics, around the policymaking practices concerning genetic interventions in human embryos in the UK and Japan. In both cases, whether consciously or not, policy actors necessarily employed the imaginaries in any actions in policymaking: to argue, organise the policymaking process, consider each argument, and make conclusive decisions. In hindsight, 'the public' that my colleague in the ministry mentioned could be articulated as another manifestation of the Imagined Publics.

Given the requirements for a social imaginary, we could conclude that the Imagined Publics are more than just imagination or prejudice. As seen in the case analysis, the Imagined Publics provided some practical standards for policymaking practice. The Imagined Publics were embedded in the policy actors' fundamental perceptions of the publics, and each argument, policy exercise, and resulting policy was constructed so that it could fit their Imagined Publics. In this regard, they were comparable to the target population in policy design (Schneider & Ingram, 1993). In addition, these mental artefacts were observable in similar manners across different situations analysed, indicating they were not case or situation-specific but rather shared, common understandings. Moreover, they were not merely held by government people or selected policy advisors; the Imagined Publics functioned as a common sense among society, based on shared conceptions of legitimacy and responsibility unique to each society. Considering these features, we could conclude that they fulfil the definition of social imaginary proposed by Taylor (2002).

The Imagined Publics also indicates the contribution of the sense of legitimacy to their construction. The comparative analysis revealed that the difference in the type of legitimacy a society stresses–in this study, input or

output–can have a considerable impact on the characteristics of the Imagined Publics, associated with a conception of responsibility. Furthermore, as demonstrated in the case analysis, the Imagined Publics situated in each science policy practice could determine the relationship between the publics and other actors, such as science or policy institutions (including elites around them). In combination with these performative features of the Imagined Publics, the thesis could prove the initial hypothesis that the sense of legitimacy could determine how the publics are situated and treated in actual science policy practice.

The utilisation of legitimacy itself as a parameter in the description of policymaking practice could be a particularly important contribution to the STS literature. For example, civic epistemology considers how a culture legitimates scientific knowledge for a basis of collective decision-making as a culturally influenced matter (Jasanoff, 2005a). However, it already embraces a pre-set conception of legitimacy (i.e., Western input legitimacy) in its framework, taking it for granted. The Imagined Publics, which can exhibit legitimation customs at a more fundamental level, can contribute to the articulation of science-policy practices with higher definition.

There are several additional findings to be noted. First, the type of legitimacy and responsibility could be two sides of the same coin. The pursuit of input legitimacy entails responsibility for the very input process. However, in Pellizzoni's words, such responsibility could be ex-post or consequentialist; as long as the predetermined input that led to the result was at its best at the time, the accountability-type of responsibility can be fulfilled. On the other hand, output legitimacy could demand responsibility for the very result regardless of input. This responsibility is quite ex-ante; as whether the future output is favourable or not cannot be determined beforehand, the associated responsibility controls their present behaviours in an anticipatory manner.

It should be of importance to argue that the type of responsibility prioritised in a given society is also highly culture-associated. This preference in the category of responsibility is embedded in a sort of contract-like relationship among science, policy and people in the society. However, this does not mean that the preferences for the types of responsibility are exclusive to each other. A society could embrace more than one type simultaneously–for example, as Pellizzoni (2004) explains, modern nation-states commonly employ accountability-type in civil service and liable-type in the judicial system. Or, there can be some overlaps and similarities among societies; accountability is not solely observed in Western countries but is also commonly mentioned in Japan as '説明責任 (*setsumei sekinin*; duty to justify actions or decisions)'. Nevertheless, the thesis could suggest that the type of responsibility they emphasise in the social compact that formulates daily communications is different between the UK (accountability) and Japan (care or infallibility). Accordingly, the mode of legitimacy primarily pursued in the policy system, which is highly associated with the sort of responsibility, can also be peculiar to each society.

Second, while the Imagined Publics are inclined to maintain their characteristics, consistent with the definition of social imaginary, the case study also indicated that they have some plasticity in their formation. Certainly, while lay members in TF in Japan tried to open up the deliberation process, it was difficult for them to speak at the meetings without the Chair's support. Nevertheless, the Chair of the CSTI changed her impression toward laypeople as well as patient groups after meeting them in person and having direct communication. She came to recognise that laypeople without scientific expertise still have the potential to discuss regulatory issues on science and technology. These findings could have some consistency with previous studies arguing for the malleable characteristic of the social imaginary (Rip, 2006; Taylor, 2004). One noteworthy feature was that the change was somewhat a by-product of lay involvement in decision-making or so-called outreach or publicity activities done by the Chair of CSTI Bioethics Expert Panel. These

activities did not have a direct impact on the decision-making, as lay membership in deliberation processes or other activities became only in name soon after the Chair stepped down. Also, the activities themselves were initially aimed at just informing people of what the CSTI Panel had discussed. This mismatch could nevertheless provide some hope for public engagement, which I will describe later.

The Matter of Scale, the Target Population

But why does our society incorporate the Imagined Publics in the science policy-making practice? The answer to this question can resonate with the challenge for public engagement in science and technology. Each policymaking behaviour is conducted in the entanglement with science, society, and other policy actors but, as an everyday activity, has to happen under limitations to real communications or assessments. Therefore, whether consciously or not, people depend on some sort of anticipation, speculation, or premise when they conduct each action in the policymaking process. The comment of the civil servant is also consistent with Page's conception of 'imaginary ministers' (Page, 2012) or Schneider and Ingram's notion of 'Target Populations' (Schneider & Ingram, 1993, 1997).

This could mirror the more general issues in national-scale science policy–that the policy institutions cannot directly listen to the voice of every citizen regarding issues at stake, and they need to rely on the imaginary of the publics. As the bureaucrat noted, it is almost impossible to listen to every citizen in national-scale policymaking practice except in national polls. It is not wise to criticise it as just an insincere excuse; rather, the present study revealed that it is for this reason that the Imagined Publics are constructed. It should not be surprising that the policymaking practices coordinated by administrative staff are highly influenced by the Imagined Publics in a given country because they are particularly important for those who deal with the publics as a mass. As science policy deals with national or sometimes global

issues, the construction of the Imagined Publics in the science policy arena is practically inescapable.

However, the Imagined Publics are not only crucial for those in the central policy arena. In empirical terms, a UK civil servant explained in my interview that the participation of a small number of people nevertheless could have influenced the other citizens through empathy; even those who did not join the engagement activities could understand that the decision was made through communication with ordinary people like themselves. The civil servant considered that the participation of a limited number of people could let other citizens think of the decisions as *our* decisions. The construction of the Imagined Publics could be influential not only for government officers but also for other members of society to share the imaginary of the citizens. The vagueness or unclear status of the people in a society can be eliminated through the materialisation of the Imagined Publics. In other words, we could also suggest that the Imagined Publics are constructed at the boundary surrounding the publics so that people both inside and outside could recognise the outline of the shape.

7.2. Learning from Social Legitimacy and Responsibility Surrounding Science Policy

Consideration of the Contrast: Superior or Inferior?

The Imagined Publics reflect how people are situated within science policymaking practice. Therefore, they indicate how science policies crafted by agencies are legitimised in their relationship with society and what sort of responsibility is applied to the connection. As demonstrated earlier, this perspective could be broader or more inclusive than previous studies, as it does not limit the legitimisation path of collective decision-making to legitimate input.

In the case study conducted in this thesis, we have seen input legitimacy for justifying the policy practice and accountability-type of responsibility for ensuring the responsible behaviours taken by policy actors in the UK policy discourse. This is unsurprising–in (Western) democratic governance, many, if not most, studies adopt or emphasise the same type of legitimacy and responsibility in their arguments (Bekkers & Edwards, 2007; Schmidt, 2012). We could see that this feature could be even more highlighted in the UK, where an empiricist way of thinking is supposed to be dominant.

On the other hand, the contrasting result from the case analysis in Japan could reveal that there is a society that shares the same basic conception of democracy but adopts different types of legitimacy and responsibility in everyday relationships between policy and people. They focused more on output legitimacy in their policymaking, and their behaviours are driven by infallibility, an excessive derivative of care-type responsibility. In Lincoln's words, we could paraphrase that while the government *by* the people is prioritised in the UK, Japan emphasises the government *for* the people. This insight could go a step further than previous studies in political sciences that tend to focus on the written legislative structure of policy decision-making processes (Lupia & McCubbins, 1994). These contrasts are not expressly written in laws or procedures. Neither are they shown as a completely fixed feature of both cultures. Moreover, they could not be absolute but rather relative evaluations described in a comparison. Nevertheless, this thesis could reveal that there is a tendency or an inclination in the adaptation of responsibility in policy communication. I could dare say that the findings in the thesis suggest that we should acknowledge the difference in the mode of democracy not only in terms of measures or approaches but also of the conception of legitimacy highlighted in a given mode.

The thesis could also suggest that differences in conceptions of legitimacy and responsibility could be highly intertwined with what sort of

legitimacy people expect science and technology can provide. The UK case reveals the affinity between scientific rigorousness in knowledge-making practice and the empiricist tradition in their society, both of which share input-oriented legitimacy. On the other hand, the Japanese case saw that the commitment of science to the predictable output could provide authoritative legitimacy in exchange for responsibility for the result, which has a sort of compatibility with hara-kiri suicide-like responsibility (see Maeda, 2012) of governmental or political entities in decision-making in respect of the resulting outcome.

It should be emphasised that this thesis has never aimed at complete separation between the UK and Japan. Some readers might argue that the described features in one country are not unique but could also be observed in another. Like Jasanoff, Porter (1995) also described the American policy administration system in contrast with the British one, as that the government need more objectivity and is preoccupied with rules, which in turn comparatively suggests the British policy custom to embrace a sense of trust in experts as exercising judgement wisely and fairly, a salient feature of the Japanese policy culture I raised in comparison with the UK case. As previous studies also imply (Pellizzoni, 2005; Scharpf, 1999), each society could understand and embed different types of legitimacy and responsibility. In hindsight, all three typologies of 'of', 'by', and 'for' comes from Lincoln's speech that is famous across nations and widely recognised as a short phrase that summarises the core conceptualisation of democratic theories (Bühlmann & Kriesi, 2013). However, this thesis revealed that there is a contrast in the type that cultural and policy customs in each country underlines. In other words, the difference could be more continuum, spectrum-like. The present results suggest that such characteristics in weighting could influence, if not determine, how policy actors are entangled, separated, and prioritised in policymaking practices and could suggest some message across the culture.

Also, I would like to maintain that these differences are not laid in a linear or hierarchical relationship and, thus, should not be compared for superiority and inferiority. The findings in the Japanese policy discourse could support this argument. True, if the relationship were coercively pushed from one side to the other, it would warrant criticism. However, with the notion of responsibility, we need to be cautious in our analytical attitude. Indeed, the case in Japan revealed the relationship was mutually accepted in exchange for the responsibility for the resulting consequence. Based on the notion of care-type responsibility, those outside the policy institutions willingly delegate the initiative in decision-making to governmental policy actors. The relationship in Japan, which is one-way paternalistic and dismisses people's participatory rights, is more like a mutual one. The present results could support Johnson's argument that the democratic social structure in Japan is not just a subordinated version of Western democracy (Johnson, 1999). Therefore, I will put an emphasis on this point and try to elucidate some implications from the Japanese case, which seemingly has no suggestion for public engagement.

The argument in the thesis could have some similarities with the censorious weblog written by Eugénie Mérieau on the Science Po website during the Covid-19 crisis (Mérieau, 2020). In the report, she critically mentioned that the previous perspectives in the Western democracy that embrace 'their self-representation as fundamentally different from China, a country exclusively apprehended through the prism of its political regime, considered as totalitarian and therefore ontologically not comparable to France or any other democracy'. She mentioned such perspectives coincide with the 'association of democracy with the West and dictatorship with the East within the framework of the social construction of their irreducible alterity', which can be a major epistemological obstacle for international comparison between policy customs. Based on the findings and discussion in this thesis, I have to argue that the previous STS literature might also have dismissed cultures other than the West as trivial or under-development or

failed to develop analytical frames that set them equivalent to the West without hierarchical dichotomy.

Meanwhile, we could find that some arguments that come from the West also share the taste that is observed in the Japanese case. For example, as Goodin describes, the green movement can easily dismiss procedural legitimacy and jump into obtaining output legitimacy (Goodin, 1992), while they certainly have always favoured grass-roots participatory democracy (Goodin, 1996). It should all the more be of worth paying attention that the movement can get into stark conflict with governmental authority in Western countries (de Saille, 2015). The culture with stress on output legitimacy could have some implications for considering green politics, but this will probably need more research work in the future.

Beyond Hostile Relationship

The findings regarding the relationship with the imaginaries of science and the conception of legitimacy and responsibility also provide critical insight into understanding the relationship between science, policy and the publics. Previous studies might have leaned toward mixing scientific, political, and policy elites as monolithic power in a dichotomic relationship with the publics (Jasanoff, 2005b; Tsukahara, 2018; Welsh & Wynne, 2013). However, the present results could suggest that the alliance between science and policy elites comes just from the conception of legitimacy they rely on, and thus, their alliance can easily collapse when their political inclinations differ. In a society where people put an emphasis on input legitimacy, empiricist arguments that prioritise scientific knowledge, or simply 'scientific imperative', could prevail. Conversely, where output legitimacy is prioritised, scientific rigorousness can be easily dismissed.

If so, we might want to give pause to somewhat aggressive articulations on the relationship between the government and people, or science and people. For example, in their analysis of scientism in the UK,

Welsh and Wynne (2013) pointed out that the procedural normalisation of science meant that science had obtained the position of 'arbiter of public authority and ultimate source of legitimation for commercial and policy commitments', which led to the ignorance or neglect of democratic considerations. Subsequently, they highlighted the imaginary of the publics as 'highly politicised publics that required surveillance and policing', which prevailed among the UK policy circles since 2000. The argument could be consistent with my findings so far, but as the element that bridges the two observations, they proposed scientism, a supreme imaginary of science that can override any other intellectual knowledge-making. However, with the consideration developed in the above sections, we could give a bit simpler explanation. Particularly in the policy environment, their recognition of scientific knowledge-making as procedurally rigid no more than goes well with the notion of legitimacy in policymaking and the responsibility behind it. Wynne and Welsh drew the imaginary of the publics from its ancestor, that is, Tony Blair's coinage as the 'anti-science brigade' (Welsh & Wynne, 2013), but we might not need to be haunted by such critical presumptions that could embrace hostility toward government or public organisations. The discord could also be explained as merely a result of a mismatch of legitimacy prioritised between groups.

Japan could face a more serious risk of confrontation. A country with an infallibility-type of responsibility does heavily rely on governmental institutions in policymaking, and the absolute responsibility for the results lies in them. If there is no trust, but high requirements with responsibility, then how can they react to society? It will lead to less communication between the governmental policy actors and society, which will end up with more mismatches in the policies they create.

7.3. The Imagined Publics Meet Engagement

The findings in this thesis, that is, the construction of the Imagined Publics and the contribution of the indigenous conception of social legitimacy and responsibility to their construction, could provide a foundation for some alternative approaches to public engagement, indicating some clues for solving problems raised in previous studies. There is literature arguing cultural differences in the institutionalisation of public engagement (see such as Loeber et al., 2011), but stepping a bit further, I would propose that a new approach to public engagement will need to consider what type of legitimacy should be highlighted and strengthened so that it will fit the indigenous policy culture. Concurrently, it could cast a reconsideration of what is meant by democratic decision-making in the governance of science.

We would not doubt that the ultimate goal of PEST in science policy, from the STS perspective at least, is to have a concrete influence on policy. That should be the reason why there have been concerns about existing public engagement practices, assuming they have little concrete impact on policy (see, for example, Goodin & Dryzek, 2006; Hansen & Allansdottir, 2011). Each engagement practice wished to integrate debates on public values into social decision-making in scientific issues, but only little impact on policy outcomes, which has been a target of criticism and analysis (Guston et al., 1999; Smallman, 2015). There is even an argument that proponents of engagement should be careful not to overstate the ability of the engagement paradigm to deliver solutions (Horst, 2014). Using the analytical framework in this thesis, we could interpret that PEST has faced trouble securing or improving output legitimacy. Then, what legitimacy can public engagement provide for our society?

The Limit of Input – For Procedural Accountability?

One common challenge regarding the trouble is that public engagement with the democratic wave has deteriorated into procedural responses to fundamental issues on science in society (Stilgoe et al., 2014).

We could paraphrase it into that input legitimacy, on which the Western conception of democracy heavily relies, does not guarantee a real impact on the decisions made by policy institutions toward more satisfaction of the publics or, more bluntly, improved output legitimacy.

The thesis could provide explanations for this challenge. The first is the gap between input and output, which is implied in the previous argument (Abels, 2007). The case analysis revealed that the administrators' activities behind the scenes are highly influenced by the inevitable existence of the Imagined Publics inside governmental institutions, which are located between input and output. Given this, it is not surprising that current public engagement practices, which take place at the input phase of policymaking processes, cannot impact the output, which stands across this black box process inside policy institutions, at a single leap.

The conception of responsibility associated with input legitimacy also proves the difficulty. The accountability-type of responsibility could only account for what had been done before the decision-making, but not necessarily for which input was considered in producing output. The consideration of the input for making a decision could be out of their responsibility because the process could entail multiple factors beyond the input alone. However, as mentioned earlier, the scrutiny of the process inside the black box for pursuing throughput legitimacy also has challenges, trade-offs and contradictions (Iusmen & Boswell, 2017). Therefore, if we want to consider output legitimacy, we need another apparatus for ensuring it.

The deliberative engagement of the publics for input legitimacy itself also has a problem of trade-off. For example, deliberative engagement in science and technology is faced with a 'fundamental problem of scale' (Lövbrand et al., 2011). Scholars have noticed that each engagement practice can be considerably smaller than the global science and its governance (Guston, 2014). The pursuit of legitimate procedures for deliberation, such as

meaningful involvement of participants, shared learning, and the consideration of a wide range of views, could require the engagement practice to be exclusive, which engages only a small group of people (Abelson et al., 2003) and thus has some problems in input legitimacy. Scholars argue that lay participants could provide input legitimacy through representation (Goodin & Dryzek, 2006; Parkinson, 2003), but it also raises concerns about bias and exclusion (Tomkiv et al., 2017). If we take these issues into account, it might not be appropriate to directly connect the result of engagement practice to decision-making.

What is Output? – Concerns for Infallibility

However, the case study also suggests that the adoption of the approach from care-type, or more precisely, infallibility-driven output legitimacy, could lead policymaking practice to another deadlock. If a society adopts this type of responsibility, all blame for the consequence of a decision could be imposed on those who made the decision. Certainly, the findings in the Japanese case cannot be an excuse for the disregard of the publics in policymaking practice in this country. However, we must recognise that their arbitrary policymaking is inseparably combined with the societal compact under the reign of this responsibility type, which shifts all responsibility for the result to governmental policymaking institutions because they cannot accept external input that would not take responsibility in case of failure. Therefore, in this responsibility regime, we need to consider if voices that come from engagement practice can take responsibility for the resulting output, as a Japanese civil servant mentioned.

In this regard, we remember that STS pointed out that science after the modern period inevitably embraces uncertainty (e.g., Beck 1998), which could conversely be a challenge for public engagement. Can engagement ensure preferable consequences before the decision is made? The fundamental character of public engagement does not seem to meet this requisite. Public engagement, by design, opens up diverse perspectives and

knowledges on scientific topics. This is why engagement practices are regarded as not having an affinity with achieving public consensus (Morrison & de Saille, 2019) or directly reaching a final solution (Horst, 2010). However, as a practical matter, these are what any policymaking is required to attain as output. To be sure, we could argue that engagement can improve the quality and acceptability of the decisions (Fiorino, 1990; Jones & Irwin, 2010), but we have to admit that engagement does not straightforwardly target a desirable closure.

This could even cast a chicken-and-egg question. Little assurance of making a difference could keep people from engagement practices (Abelson et al., 2003). In addition, public engagement can be time-consuming if aimed to be well done (R. G. Lee & Petts, 2013), but such a property can be unattractive in the decision-making phase. Indeed, proponents of direct public engagement imply a model of the 'scientific citizen', which could conflict with the fact that most citizens have no enthusiasm to take on the role that participatory modes of governance seek to afford them (Sturgis, 2014). Therefore, we need to admit that policymaking practice's inclination toward reaching closure has a structurally uncomfortable relationship with public engagement.

Engagement for Tuning the Imagined Publics

The point here is not that public engagement is inadequate or inappropriate for involving a social perspective in scientific development. Rather, it could provide a foundation for the argument that the Imagined Publics could be an alternative solution to this dilemma, which can connect both input and output legitimacy.

The case analysis revealed that science policy embraces the Imagined Publics existing in a given society. Making up for the lack of direct communication with those who are not core members of the policymaking activity, the Imagined Publics are instead employed as a beneficiary of the policy made, a stakeholder of the policy made, or a collaborator in the making

of the policy. When it comes to actual communication, the counterpart does not self-evidently exist; rather, it is materialised on the basis of the Imagined Publics shared in the society. If so, it would not be unnatural to consider that the Imagined Publics could be one of the obstacles to public engagement having a concrete impact on the policy output and one of the reasons why engagement is necessary. Indeed, the outdated, ill-tuned Imagined Publics prevailed in the Japanese policy arena have made the government's policy totally inconsistent with the people's needs. The Imagined Publics are constructed with anticipation, speculation, or normative presumptions regarding the social status of the relationship between science and the publics and their thoughts based on the limited amount of real communication with the publics in both terms of scale and opportunity. The Imagined Publics *communicate* with policy actors behind the scenes, or more precisely, inside the black box process in the science policy-making practice in the policy arena.

Conversely, the case suggested that communication involving laypeople has the potential to modify the Imagined Publics, even though it has no direct impact on the policy decision-making at stake. In this regard, the experimental engagement led by the chair of the Japanese panel can remind us of some implications. Through direct communication with such people outside the policy terrain, the chair had changed her impression toward laypeople without professional, scientific expertise and recognised such people as capable of joining the policy debates. Consistent with the characteristics of the social imaginary, it could have been a clue to change the Imagined Publics. Such momentum, unfortunately, did not continue after her term as the chair, but it is not too much to assume continuous engagement is capable of tuning up the Imagined Publics shared inside the policy arena as well. Given these observations, future arguments for public engagement might want to presuppose the existence of the Imagined Publics and turn the focus to the alternation or modification of the Imagined Publics instead, particularly involving those working inside the policy arena. If the

construction of the Imagined Publics is unavoidable, the public engagement practice can turn its focus onto adjusting the Imagined Publics themselves.

This shift in the target of engagement, acknowledging a black box step in the policymaking processes, has the potential to complement both input and output legitimacy in both UK and Japanese political culture. On one hand, as policy outcomes reflect the Imagined Publics, tuning the Imagined Publics has a concrete influence on the policy, thereby improving output legitimacy. On the other hand, engagement practice does have an input aspect, so the introduction of such activities surely addresses the deficit of input legitimacy. Importantly, while continuous efforts to update the Imagined Public are needed, these two benefits do not deteriorate each other because they are not provided concurrently due to the black box between input and output. In other words, you can chase and catch two hares at the same time.

However, this approach seeking both input and output legitimacy is not merely a combination of the policy customs in the UK and Japan. The engagement to update the Imagined Publics does not permit mere procedural performance because the subsequent daily decisions of officials cannot neglect the updated Imagined Publics, both technically and normatively. Meanwhile, this approach arises from in-order-to-motives and does not coerce policy actors into an infallible commitment to satisfactory output but instead provides the foundation for better future decision-making. Therefore, the responsibility here is not just a combination of accountability and infallibility. Rather, engagement for tuning up the Imagined Publics with future-oriented and in-order-to motive adds a flavour of responsiveness-type responsibility, which Pellizzoni describes as 'an encompassing yet substantially neglected dimension of responsibility'.

Due to the shift of focus from issue to people, this tuning-up engagement will not completely sweep away but rather align with indigenous

legitimacy and responsibility conceptions. In an accountability-type culture, the effect of this engagement is slow-acting, working behind the scenes to improve output legitimacy, but this shift will not confuse policy actors because the input actions and processes remain largely the same as conventional issue-focused engagement. In a care-type culture, the introduction of this custom is not to change the decision-makers physically but could be seen as an extension of care-type responsibility, requiring policy actors to have more knowledge about the publics they care for, which is important for output legitimacy. The responsiveness-type of responsibility shares commonalities with indigenous conceptions of responsibility in both the UK and Japan, which might enable its adoption without drastic changes in mind or in the political system. Nevertheless, it has the potential to improve legitimacy quite effectively.

Moreover, this approach could compensate for the shortcomings in the regimes of legitimacy and responsibility in the UK and Japan. In the UK, efforts to tune the Imagined Publics can prevent conflicts around so-called 'unruly' interventions for output (de Saille, 2015). As previously discussed, unruly behaviours by 'uninvited' citizens, framed by conventional issue-focused engagement, could trouble policy actors who pursue accountability. If the purpose is to grasp the picture of the publics, there will be no 'uninvited' citizens in engagement practices, so policy actors do not need to be troubled by those who act in an 'unruly' manner. In Japan, the engagement practice for tuning the Imagined Publics can break the deadlock of the infallibility-type responsibility regime. For those burdened with infallibility, public engagement for input legitimacy can result in taking responsibility for the outcomes of others' decisions, which might evoke resistance. An in-order-to flavoured citizen intervention respects policy actors' sovereignty in their work, which could ease their hesitation.

From a different viewpoint, we could interpret that new participation demanding responsiveness-type responsibility from policy actors also

requires participants to aid policy actors in fulfilling their conventional responsibilities. In the UK, well-ordered engagement will help policy actors protect accountability. In Japan, future-oriented engagement can avoid imposing another infallibility-type of responsibility on policy actors. These achievements are only possible through the continuous engagement of citizens in updating the Imagined Publics, not by one-shot delivery of opinions or thoughts. In other words, while tuning-up engagement will impose a responsiveness-type of responsibility to policy actors additionally for supplementing insufficient legitimacy, it will also require participants to share some part of the responsibility for the other legitimacy that is fulfilled by the existing schemes. It might sound harsh but given that engagement seeks co-creation but not a one-way flow of opinions or views, it could also be rational to assume some sort of shared responsibility between people and policy actors in the policy arena as collaborators.

Furthermore, this approach can overcome some technical and practical challenges that previous engagement endeavours have faced with. For example, the engagement for tuning the Imagined Publics can be more visibly evaluated in terms of its impact. Also, public engagement for the maintenance of the Imagined Publics can take place rather as a daily practice than a special event when the issues are evoked. As long as the target is imaginary and does not need a direct connection with an exact entity, the challenge of scale or time no longer seriously matters.

This call for the tune-up of the Imagined Publics around the policy arena could share the same standpoint with the proposal of Morrison and de Saille (Morrison & de Saille, 2019). While acknowledging the importance of engagement, they also admit that consensus is not only problematic to reach but also difficult to measure and to know when it might be achieved. Instead, they offered that 'the aim of engagement should be to try to find new and alternative ways of interrogating the context of technological deployment as much as the technology itself'. Their exploratory use of dialogue and

engagement could be reconcilable with my argument for affecting the shared Imagined Publics instead of aiming at the direct impact on resulting policies. If I could add one more thing, we can think about how to deliver the 'context' into policymaking practices. The findings suggest that the Imagined Publics embraced by administrative staff can function as a vehicle. This could help public engagement move beyond mere normative arguments by providing a supplemental foundation for arguments for public engagement from a practical or instrumental aspect (Fiorino, 1990; Stirling, 2008).

The adherence to legitimacy and responsibility could possibly help my arguments go beyond other existing arguments. For example, they could tell us that we need to be careful about highlighting the experimental aspect of engagement practices (Chilvers & Kearnes, 2020) too much. In terms of legitimacy and responsibility, it does not set foot in how engagement practice can influence the output–the black box process–and might seem to avoid taking this responsibility for the output. If public engagement organised in decision-making seeks to have an impact on the output, the engagement practice would need to take responsibility for the resulting output.

7.4. The Implications for Future Research

It must be admitted that my argument for public engagement as a tuning of the Imagined Publics comes from rather speculative discussions based only on observation of the policymaking cases in this thesis and thus requires more empirical evidence. Therefore, future research will need to examine whether and how public engagement can modify the Imagined Publics, particularly those prevailing around the governmental policy institutions.

To examine the applicability of the arguments of this thesis across countries, we should consider the differences in cultural and political systems in each nation well beforehand. For example, the countries studied here, the

UK and Japan, both exhibit high commitment and practical involvement of civil servants in policymaking practice (Mishima, 2017; Page, 2003; Page, 2013; Tsuneki, 2012). However, the carriers of the Imagined Publics could be different in countries where the presence of civil servants is relatively lower. Also, the indigenous shared conception of legitimacy and responsibility must be well respected. As a call for responsiveness-inspired public engagement is just to provide an add-on to existing policy cultures rather than to replace them, the analysis of the difference in the prioritisation of these principles could provide a more tailored-fit approach to public engagement in each society.

If I may add some preconditions for such research on public engagement, I would like to emphasise the engagement of the administrative staff as well as the citizens rather than treating them as machinery or opponents. This could be consistent with the co-creation. Indeed, my thesis has partly revealed that how the actual citizens are situated in the science policy practice is influenced by the Imagined Publics that administrative staff embrace. Therefore, it cannot be adequate to conduct public engagement practice and just provide its results to the policy actors in a procedural manner. Rather, it should be necessary to directly involve such policy actors and stimulate them to update their recognitions through direct communication with the actual people. Previous arguments have often depicted administrative staff in governmental organisations as adversarial against people, but the thesis could suggest that we might want to engage them in the circle of co-creation. As the introduction intimates, the governmental staff are not so much neglecting but are thinking of the public.

Appendix: catalogues of questions

<Note>

These questions were provided for the preparatory purpose, and actual interviews did not necessarily follow these questions one by one but will be conducted in a more open-ended, conversational way.

Catalogue of questions 1 – to committee members

1) those who attended committees as a member
2) or who belongs to authoritative position in academia or industry

I. General recognition of the relationship between other players and themselves

1. *To elucidate the self-image of scientific advisors in policy-making*
   a. What role do you think you (scientific advisors) should play in policy-making processes?
      i. What do you think you must do or should do in the policy-making?
2. *To find out their perception of other players and boundary among the players including themselves*
   a. What do you think is the difference between policymakers and scientists from the public?
   b. What do you think is the difference between the public and scientists in policy-making processes?

   (if applicable) Could you draw the correlation diagram of policy-making process, allocating the following actors?

   Politician/Policymakers/Scientists/Scientific advisors/Stakeholders/the public

   * You can add other characters if you want
3. *To find out the recognition of science and scientific knowledge*
   a. What role, in your opinion, do science and scientific knowledge play in policy-making processes?
      i. From your perspective, how are they involved in policy-making processes?
4. *To find out their recognition of the publics (imaginary publics)*
   a. What do you think about public concerns or public opinion?
      i. How do you usually find the concern?
   b. What, if any, is necessary for the publics to be engaged in policy-making processes?
      i. Why could it be crucial?

II. Topic-specific question

5. *To find out their perception of other players and boundary among the players including themselves*

a. What do you think is difficult about the technology referred to in the policy issue?
b. How is this difficulty dealt with through the discussion in the committee?
c. Do you think the difficulty will be cleared in the future?
d. How, in your opinion, could we avoid the birth of a genome-edited child in China?
    i. What is needed to avoid another birth of a genome-edited child without world consensus?

6. *To find the way they recognise/ find out scientific and social concerns*
    a. What do you think is the concerns related to [the policy issue]?
        i. Why is it so important, and for whom?
        ii. How do you find the concern?
        iii. What possible solution can be applied to the issue?
7. *To find out their recognition of public engagement*
    a. How do you think the publics should be informed about [the policy issue]?
    b. How do you recognise the public concerns or opinions?

Catalogue of questions 2 – to public officials

1) working at public (or rulemaking) institutions
2) and who materialise the needs and concerns as regulation or policy

I. General recognition of the relationship between other players and themselves

1. *To elucidate the self-image of policymakers in policy-making*
   a. What role do you think you (policymakers) should play in policy-making processes?
      i. What do you think you must do or should do in policy-making?
      ii. How different is your role from that of politicians?
   b. How do you find policy-making needs in a certain area?
      i. Who inform you first? / How do you search more in detail?
2. *To find out their perception of other players and boundary among the players including themselves*
   a. What do you think is the difference between scientists and policymakers from the publics?
   b. What do you think is the difference between the publics and policymakers from the scientists?

   (if applicable) Could you draw the correlation diagram of the policy-making process, allocating the following actors?

   Politician/Policymakers/Scientists/Scientific advisors/Stakeholders/the publics

   * You can add other characters if you want
3. *To find out the recognition of science and scientific knowledge*
   a. What role, in your opinion, do science and scientific knowledge play in policy-making processes?
      i. From your perspective, how are they involved in policy-making processes?
4. *To find out their recognition of the publics (imaginary publics)*
   a. How do you find public concerns or public opinion?
   b. What, if any, is necessary for the publics to be engaged in policy-making processes?
      i. Why could it be crucial?
      ii. How do you usually find the concern?

II. Topic-specific question

5. *To find the recognition of the advisors (= what they think they lack) in the topic*
   a. How did you choose the membership of the committee?
   b. What did you expect the committee to do?
      i. How did or did not the committees went as intended?
6. *To find out their perception of other players and boundary among the players including themselves*
   a. What do you think is difficult about the technology referred to in the policy issue?

b. How is this difficulty dealt with through the discussion in the committee?
c. Do you think the difficulty will be cleared in the future?
d. How, in your opinion, could we avoid the birth of a genome-edited child in China?
    i. What is needed to avoid another birth of a genome-edited child without world consensus?

7. *To find the way they recognise/ find out scientific and social concern*
    a. What do you think is the concerns or impacts related [the policy issue]?
        i. Why is it so important, and for whom?
        ii. How did you find or recognise them?
        iii. How did you, or will you deal with them?
8. *To find out their recognition of public engagement in the topic*
    a. How do you think the publics should be informed about [the policy issue]?
    b. To what extent do you think the publics are engaged in the policy-making on this issue?

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