Beginning of Future Design

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Introduction: Discovery of Iroquois Indians

In March 2012 I was invited by John Stranlund, a professor at the Department of Resource Economics at the University of Massachusetts and a former student of mine at UC Santa Barbara, to give a report on my research paper resolving the Prisoner's Dilemma. The Prisoner's Dilemma is a situation in which two players could produce good results if they cooperate with each other but cannot do so easily, since one player will get even better results by not cooperating even if the other player does. Although the dilemma is named after prisoners, the original issue was that the United States and the Soviet Union had both come to possess nuclear weapons, making it possible for both sides to deliver a catastrophic blow to its opponent by a preemptive attack (= not cooperating). However, nuclear war did not break out between the two. I had designed an approval mechanism as a new framework to explain this and demonstrated its great effectiveness through an experiment using subjects.

After giving the report, I had dinner at a Chinese restaurant in Amherst with John, his wife Laura, and seminar participants, where our conversation revolved around the fact that while social dilemmas such as the Prisoner's Dilemma were issues for the current generation, climate change and massive public debt were issues for future generations. When the current generation emits greenhouse gases, its impact will fall on future generations, not the current one. Likewise, massive government debt means that the current generation uses resources now that are to be used by future generations in order to enjoy a better life now.

Issues like climate change are difficult to resolve because the future generations, who are parties to the issue, do not exist yet. Thus, I proposed a mechanism in which an imaginary future generation, which I named the "Ministry of the Future", is selected from the current generation and the two generations negotiate with each other. In fact, this proposal would eventually lead to the first practical future design in the township of Yahaba, which I will explain later. In response, Laura began explaining that there had been people in America who had actually used such a mechanism – the Iroquois Indians. According to Laura, when the Iroquois face an issue that concerns the future, they decide what to do now from the perspective of the seventh future generation. I had casually proposed an imaginary future generation and a Ministry of the Future; I was shocked by the fact that there had been people who had designed and actually used such a social mechanism.

That night, back in the hotel where I was staying, I began looking into the Iroquois Indians on the Internet. "Iroquois" is not the name of a single tribe. In the 17th century, five tribes in the Great Lakes region formed a league later known as the Iroquois Confederacy. Another tribe joined it in the first half of the 18th century, making it a federation of six nations. The Great Binding Law is the equivalent of a constitution that holds the confederacy together. And the law proclaimed, "Look and listen for the welfare of the whole people and have always in view not only the present but also the coming generations, even those whose faces are yet beneath the surface of the ground – the unborn of the future Nation." Their constitution explicitly required consideration for future generations in order to maintain a confederacy that consisted of different tribes.

Launching the Seventh-Generation Study Group

For a long time, as a researcher in economics, I had worked to construct theoretical models and design social mechanisms using the maximization of personal benefits as the basic axiom. However, I was also aware that the Payoff Maximization Axiom was not the only feature of human beings, since I had been conducting experiments simultaneously using subjects. According to neuroscientist Robert M. Sapolsky in "Super Humanity" (*Scientific American*, Vol. 307, Issue 3, 2012), human beings have three characteristics: impulsivity, relativity, and sociability. Let me explain them, perhaps a little differently than Sapolsky.

Impulsivity means more or less immediately consuming something that is in front of you. The meaning could be stretched a little to call it myopia. Relativity means reacting to change. When it suddenly becomes dark, you must react in a way that enhances your chances of survival. In other words, you react not to the absolute level of brightness but to the relative change in it. This more or less means looking for a state that maximizes a function, i.e., a state whose derivative becomes zero. This is the Optimization Principle; it is the equivalent of the Maximization Axiom in economics.

Now let's look at sociability. Although human beings were no better than other animals anatomically, they reached the top of the food chain by cooperating with each other. But I would like to add a fourth: optimism. Where the future is concerned, Tali Sharot explains optimism in "The Optimism Bias" (*Current Biology*, Vol. 21, Issue 23, 2011). Human beings tend to be overly optimistic about the

future.

In this manner, I had despaired that human beings did not have the ability to resolve long-term issues such as climate change and debt accumulation. That is why I found the Iroquois so moving; they had prescribed a social mechanism to become people of the future to consider what to do now in their constitution and used it. I spent quite a lot of time on the Internet that night researching the Iroquois but could not find enough to satisfy myself.

At the time, I belonged to the Osaka University Center for Environmental Innovation Design for Sustainability (CEIDS), where I ran a monthly research meeting with young engineering researchers. When I returned from my trip and talked about the Iroquois, the participants also found the story moving and named the group "The Seventh-Generation Study Group". As for the Iroquois themselves, we found that they had had a significant impact on the designing of the American political system. The 13 British colonies in America took in many ideas from the Iroquois including "confederacy" in order to seek independence from the United Kingdom and construct a political system that was different from those of Europe at the time, though we also learned that that the concept of "seven generations" was not adopted by the US Constitution. Furthermore, it appears that the Iroquois also had a major influence on European Enlightenment thinkers, who invited Iroquois to give speeches to show that a democratic system that was more advanced than those in Europe had already emerged on the other side of the Atlantic – *gaiatsu* (external pressure), if you will.

It was Michinori Uwasu who began pointing out in this study group that the market had a problem. A well-known "market failure" is that the market does not function well when there is uncertainty about the future. Uwasu introduced the point that the market does not function because future generations cannot participate in it, a perspective that differed from those of the past. Researchers followed this with the presentation of studies in their respective fields on the changes that would occur when the "seventh generation" idea was adopted.

Future Design Begins

The Seventh-Generation Study Group became a forum for young researchers to present the seeds of creative research, and the time came to change its name to "The Ministry of the Future Project". Research on the political organizations that included the perspective of future generations had begun. Taking the lead in this initiative were Uwasu and Masahiko Ozaki. This process in turn made us aware that what we were seeking was not merely to establish any specific institution in this society of ours but to design systems that are resilient and structurally stable in the face of change. Thus, we changed the name again, to Future Design (FD). We lacked research funds at the time, so we created an imaginary future generation during classes and observed what happened. Taking the lead in this were Keishiro Hara, Uwasu, and Masashi Kuroda. Shinsuke Yamanaka, the deputy director of the CEIDS, who is now a Nuclear Regulation Authority commissioner, took note of our research and encouraged us to publish a declaration of FD as a new field with potential despite the simplicity of the concept.

I transferred to Kochi University of Technology (KUT) in 2013 but continued to participate in the monthly meetings at Osaka University and began work on a book. All the prospective authors met on the KUT Kami Campus in November 2011 and held an event in which we critiqued the manuscript chapter by chapter. However, virtually none of us had research funds for FD, so the book turned out to be a declaration of intent, in which we laid out the kind of research that we would do if we had the funds. This was followed by several more meetings and the results were published in the spring of 2015 as *Future Design: A Society That Thinks Seven Generations Into the Future* (Keiso Shobo).

KUT distributes over 1 million yen per head in research funds. Using this, the first FD-related study began in 2014. I started by building the simplest model possible for climate change, debt accumulation, and other such problems. Each generation would make a choice between options A and B. Say that the benefit from A is larger than that from B, at $36 and $27 respectively. If the current generation chooses A, the benefit to the next generation from A and B will be reduced by $9 each to $27 and $18. If the current generation chooses B, the benefits of A and B to the next generation will remain unchanged. We named this the Intergenerational Sustainability Dilemma Game (ISDG).

ISDG Results

When conducting experiments with subjects, the size of each generation must be determined. I wanted to use just one person as an imaginary future person. That meant that the sum of the number of people in each generation had to be larger than two in order to

avoid the possibility of deadlock between two persons representing the future and current generations respectively. Furthermore, I wanted to keep it simple while creating an environment that minimized the effect of an imaginary future person, so I decided to use three subjects – two of whom would constitute the current generation. This way, if the current generation chose A and the imaginary future person B, it would be more difficult for the imaginary future person to have an effect since it would be in the minority. If the imaginary future person was still effective in this environment, which made it difficult for it to be effective, it would mean that the effect of the imaginary future person was robust, an example of experimental economics at work.

When the ISDG framework was explained to researchers in the economics field, the response that came back was that there was no way that B would be chosen whether or not there was an imaginary future person. So, I designed the experiment, wrote the instructions, collected the subjects, secured classrooms at KUT, and tried to conduct the experiment on my own. At that point, I was stymied: there were too few students in my seminar to conduct the experiment, busy as they were working side jobs. It was then that Nobuhiro Mifune and Asuka Komiya, social psychologists, gave me their support, and Yoshio Kamijo also came to my rescue over and beyond his role as a research economist.

In the experiment, with some 200 subjects, B was the choice of 28% of the groups without an imaginary future person and 60% of the groups with an imaginary future person. The effect of the future generation was clearly verified. Given these results, I did what I should have done in the first place and began to search for studies along similar lines that used the concept "imaginary future generation". Several days of searching confirmed that there were none, so the study was published as the first outcome in FD studies as "Negotiating with the Future", by Kamijo, Komiya, Mifune and Saijo (*Sustainability Science*, 2017).

Growing Number of FD Participants

The first results above were obtained in February 2014. When I reported them to the FD group at Osaka University, its membership grew dramatically. It apparently had stimulated the intellectual curiosity of young researchers. From then on, the experimental research at KUT began to produce a wide variety of results under the leadership of Koji Kotani, Yoshinori Nakagawa, Yoichi Hizen, and Kamijo. Ryuta Aoki has started neuroscience research in FD with Kotani. Meanwhile, during a business trip in October 2014, I happened to be watching *Close Up Gendai* (a popular NHK news program) when it was showing how the unsustainability of a water utility was being overcome. It was a presentation of a workshop conducted by Ritsuji Yoshioka and his fellow residents in Yahaba, a town in Iwate Prefecture. Although this was not FD itself, Yoshioka came across to me as a pioneer in FD. I asked Hara, who was more or less of the same generation as Yoshioka, to contact him, which led to the FD work in Yahaba.

Yahaba Mayor Shozo Takahashi issued a declaration designating it as a "Future Design Town" and drafting has begun on a comprehensive plan under Yoshioka and Hara's command. Shinshu University Professor Naoko Nishimura is collaborating with the city of Matsumoto to use the FD method in drafting the city hall restoration plan, reviewing the traffic system, and the like. KUT's Nakagawa has been working with Kyoto Prefecture and the cities of Uji and Nagaokakyo to use FD on increasingly hard-to-maintain infrastructure. Toshiaki Hiromitsu in the Ministry of Finance has been conducting FD experiments on his own with positive results; Reiko Aoki at the Japan Fair Trade Commission is attempting to use FD for innovation; and Keio University Professor Keiichiro Kobayashi is giving FD its place in economic thought and philosophy.

There are many more examples of FD studies and applications, but they will have to wait till the next opportunity since I have run out of space. JS

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