

# **Demeny Voting and Its Impact**

**NIRA Round-Table March 10, 2011<sup>1</sup>**

**Paul Demeny, Reiko Aoki, Izuru Makihara, Jiro Ushio, Noriyuki Yanagawa**

---

<sup>1</sup> This is an English translation of NIRA Interview Series No.62 “Impact of Demeny Voting” (Domein- touhyouhou no Shogeki).

## Main Points

- The birth rate in Japan remains lower than the target rate. Both the population size and composition by age mean an increase in the number of elderly people and a decrease in the number of young workers.
- We should squarely address the essential problem inherent in the current voting system, that is, the problem that the interests of the next generation cannot be reflected in decision-making under the current system.
- Demeny Voting, which aims to provide parents or prospective parents extra votes, is also expected to work to recover the birth rate.
- We have not implemented measures to address the low birth rate issue as a source of major threat to national strength. Demeny Voting will serve to trigger fundamental discussions on the low birth rate and inspire new policy ideas.

**Demeny:** I am pleased to have this opportunity to talk about such an important issue and would like to extend my gratitude to you for giving me this opportunity.

It is estimated that the current population of Japan is at its peak, and if present fertility levels will continue (along with further improvements in mortality and some positive net immigration), by the end of the 21-st century Japan's population will fall to appreciably less than half of its present level. This diminished population will be also vastly more aged than is the case currently. Such a drastic change in a nation's population, in terms of both size and age structure, would lead to eventual economic and social collapse.

Demeny Voting is an idea that I proposed in a paper in 1986<sup>1</sup> and refers to providing the right to vote to minors. Because elderly people account for the majority of voters in a democratic government, the future of the younger generations and the long-term survival of a nation tend to be less of a priority. Therefore, I believe that we should have an election system in place that reflects

the views of minors who currently do not have the right to vote.

Specifically, I propose to allow parents with children under the voting age to vote on their behalf. The simplest way would be for fathers to vote on behalf of their sons and mothers on behalf of their daughters. Another method would be to grant each parent 0.5 votes so that both parents could cast a proxy vote (worth half a vote) for each of their children.



Paul Demeny  
Distinguished Scholar, The Population Council,  
Inc.

**Yanagawa:** I think that the Demeny voting system has two very significant implications: one is that it inspires us to think more flexibly about fair and desirable voting systems or voting behaviors through discussions like this one. The essential problem inherent in the current voting system is that it does not reflect the views of children or those of future generations. In reality, however, cases are increasing, where the decisions made now will have a great impact on future generations. Although typical

examples of such cases are pension and social security systems, they can also be found in the field of investment. For example, public investment or large-scale investment in science and technology will yield fruit in the future, which will be reaped by our children or grandchildren. As Demeny Voting proposes, we should seriously consider an election system that gives children the right to vote is one type of voting system.

Particularly in Japan, since the distribution of the population is skewed toward older age groups, the votes of older people carry more weight than those of younger people. Actually, one vote among the younger generations has much less value now. In this sense, intergenerational inequity already exists. I think there should be more discussion on how we could correct it.

Another implication is that we should address the low birth rate issue more seriously. Although we think we have implemented different countermeasures, they are still far from satisfactory. We will come back to this point in the latter half of this interview.

**Aoki:** The problem in Japan is that despite the fact that demographic aging has accelerated due to the low birth rate, no real action has been taken. Demeny Voting has important implications in that it sounds the alarm about the current situation. I began this study because I found that the redistribution of income among generations was skewed

to the older generation. I think that investments in the future by the nation as a whole are decreasing as the age of the population changes. It is not a matter of a choice between the two, such as pensions or education, but rather... I think since the real world is changing, the industrial structure and scientific technology should also change. However, if the current situation continues, the investment required for such a transformation or investment in the future will decrease due to the aging of the population and the low birth rate. No one wants to invest in the future at the expense of oneself.

There is one way for society to focus on investments in the future. It is to provide a political voice for future adults, that is, today's children. Specifically, there is a method where parents vote on behalf of their children as Dr. Paul Demeny proposed. By giving parents and children a greater political voice, policies with a long-term perspective that seriously consider the future situation would be selected in an election. Older people often say that they do care about the future. In fact, they provide generous support to their grandchildren. However, if they have to do something for future generations as a whole, they would say, "Why me?" In the Demeny voting system, however, every member of society shares the burden so that our resources can be used for future generations. One of the advantages of changing the election system is that it

enables an all-out commitment by society as a whole.

I think there are many other ways. For example, the retirement age can be raised, which requires transformation of the entire labor market. Compared to changing the retirement age, the redefinition of the right to vote is technically easier to implement, although the idea is unusual. For example, when a campaign for women's suffrage occurred in Japan, one of the reasons was that the labor market needed women. This time, it can be said that since the age composition of the population has become heavily skewed toward older age groups, the current election system should be changed to the one that ensures investments in the future. We should have discussions on this point today to inspire national debate.

**Demeny:** According to the estimates by Dr. Aoki, retirees will account for the majority of Japanese voters over the next decade. It is urgent to do something about it.

My idea is not necessarily unusual or irrational. In fact, six years after I proposed the idea, Lee Kuan Yew, the ex-prime minister of Singapore, known as the father of Singapore's independence, also proposed a similar idea. Moreover, ten years later, a similar proposal was deliberated in the Federal Diet in Germany. And this morning, I received information from a friend at Duke University that the Hungarian

government released the first draft of the new constitution to invite public opinions. When I read Article 22 of the draft, I was very surprised because it stated that one additional vote would be granted to women with a child.



Reiko

Aoki

Professor, Institute  
of Economic Research, Hitotsubashi  
University

To my knowledge, this Hungarian case is the first time that the idea was officially proposed in a constitution. As is the case with Japan, Hungary faces a demographically difficult situation.

**Ushio:** Today, democracy has become very pragmatic, and elections are conducted with a focus on the present. By contrast with this, I think the concept of Demeny voting is significant in that it prompts us to consider future generations and population issues when voting. This type of idea has actually often been associated with authoritarian regimes, and it is highly significant that Dr. Demeny's proposal would realize this

approach via democratic processes.

## Impact of Dr. Demeny's Proposal

**Makihara:** I think that Demeny Voting is important as one of the ideas to produce new political issues because it gives rise to a certain kind of agenda setting process. Being shaken by this proposal, people may start to think spontaneously about what they can do to solve the low birth rate issue. It may also



Izuru Makihara

Professor, School of Law, Tohoku University

trigger much discussion on new policies and institutional reforms, such as electoral reform.

Then, the next step is to work out a way to shape Demeny Voting as a specific voting system. For example, not only giving an additional vote to parents for each of their children, but other methods, such as the spontaneous return of votes by senior citizens, can be considered. If elderly people feel that they are placing a burden on younger generations in terms

of pensions, what about a method where they could spontaneously return their votes as is the case with a driver's license? Thus, Demeny Voting triggers much discussion on a variety of ideas related to system design.

The idea of giving additional votes to mothers in Hungary seems to suggest that as long as the low birth rate is concerned, more consideration should be given to women's political views than to men's. This idea may have important implications for the future of Japan.

**Yanagawa:** I think that the idea of Demeny Voting will have a greater impact on regional elections, where one vote has relatively greater weight or where having one vote or two votes determines the election results, than on elections that cover a wider area.

### **Serves as an opportunity to consider the theme of "the low birth rate and family" anew**

**Yanagawa:** I used to think that giving additional votes to parents would contribute to the correction of intergenerational inequity. However, Dr. Demeny emphasized the potential of giving additional votes to parents or potential parents as an incentive to have more children or as one of the effective measures for the issue of the low birth rate and an aging population. It was an impressive point of view as I have not viewed the issue that way.

**Demeny:** In terms of measures for the

low birth rate, I have some ideas that should be implemented along with the Demeny voting system. For example, one social policy could be to give preferential treatment or subsidies to large families with more than three or four children. If one parent, probably a mother in the case of a married couple, who is totally dedicated to child rearing, decides to have a third or fourth child, a wage is paid for her work. I think such a policy should be considered. Each individual has the right to be single or the right not to have or to have a child; therefore, if we are to strike a balance with such choices, we should give preferential treatment to large families with three to four or four to five children.

**Ushio:** In France, the rate of tax cuts increases as the number of children increases. The country has also put in place various programs of allowances, and by these means has successfully brought the birth rate back to the 2.0 level. I was talking with a French minister about seven years ago, and he said that he has five children because the tax benefits are sufficient for him to be able to hire one or two maids or tutors. There are many other measures in place in France that encourage people to have children, such as giving the right of inheritance to children of unmarried parents and allowing homosexual couples to adopt children. These measures have been successful. Dr. Demeny, what do you think of this success in France?

**Demeny:** I think that much of it can be achieved if a tax system that promotes childbirth is introduced. However, it is too early to conclude that the experiences in European nations have been great or bright.

One thing that I personally named as one of the key points of my proposal suggests something more radical than just granting tax incentives or additional preferential treatment to large families. It is to give a subsidy equivalent in amount to the income that could be earned if one of the parents, probably the mother, worked full-time outside the home. It is based not on a simple uniform rate, but on a system where the rates change with each person's educational background and qualifications, as is the case in the labor market.

**Makihara:** I suppose that probably in France, there are many families where parents are not recorded as a married couple in the family registry. Such an environment makes it easy for the children of the ex-spouse to live with the family of the current spouse when the parents are divorced.

On the other hand, Japan strived to reconstruct its public finances by placing the burden of welfare on families in the 1980s. The government strived to reduce spending on social security by maintaining and capitalizing on the traditional family system. I think that one of Japan's major drawbacks lies in the fact that Japan tried to implement population policies not by transforming

the traditional family system, as was the case with France, but by maintaining it. Moreover, when the issue of the low birth rate and the aging population became very serious, the status of public finances was much worse than that in the



Jiro

Ushio

Chairman, National Institute for Research Advancement (NIRA)

1980s. Consequently, people were forced to decide how they should use the limited budget: for the issue of the low birth rate or for the issues of medicine and elderly people.

**Ushio:** The problematic that we are discussing today is based on the recognition, common to Japan and the rest of the world, that the electoral system is important to democracy. I think that the Demeny proposal suggests a means to bring about a major qualitative change in the election system, that is, to give one vote to each parent and one vote to each individual concerned with the issue of the low birth rate. The current situation is that we have a democracy oriented towards an

aging population, where elderly people receive most of the benefits of taxes. This is tax-eater democracy. A sound nation should be based on taxpayer democracy. I think this proposal will serve as an opportunity to address this very important issue – how we can transform democracy to orient itself towards the family.

**Aoki:** I think that the family system and democracy have historically had strained relations. In Japan, for example, people tend to think that women can be liberated only after the large family system collapsed. Consequently, we are forced to choose between family and democracy. I think this is one of the reasons why the issue of the low birth rate has not been squarely addressed in Japan. As Chairman Ushio mentioned, Demeny Voting has a fusing aspect, such as combining the family system with democracy.



Noriyuki Yanagawa  
Trustee, NIRA

**Ushio:** I think that creating a system

that enables the family and democracy to coexist would be a very Japanese approach. If we can succeed, it would represent a significant reform.

**Yanagawa:** Since Asian nations have a social structure similar to that of Japan, if we can succeed with the reform, it can be successfully applied to other Asian nations.

**Ushio:** And it would be an opportunity for Japan to take the initiative with regard to an Asian Community.

### **Low Birth Rate, Aging Population, and Working Age Population**

**Yanagawa:** I think various measures have been implemented in Japan, as well, and it is not true that we have done nothing for the issue of the low birth rate. However, I think that there is a significant gap between Dr. Demeny and those who have implemented measures as to the awareness of how serious the low birth rate issue is. Although we say it's a serious issue, it is questionable whether we have implemented measures with a real understanding that the low birth rate is the fundamental factor causing considerable damage to the national strength of Japan.

The working age population of Japan has been rapidly declining since around 1991. It corresponds to the time when the economic slump continued after the collapse of the bubble economy. Therefore, when the working age population



declines, we tend to think and discuss that high growth cannot be expected, which in turn leads to much discussion on growth strategies and how to improve productivity. Amid such a context, we have failed to fully address the issue of population, for which we should be held responsible.

**Ushio:** I agree that the working age population is an important point. While the unemployment rate is much discussed in Japan, if the working age population is declining, the unemployment rate will also decline. In actuality, the most important point is how many workers there are in each industry category and in each region. Another important point is that while some argue that the declining population is not a major issue, the low birth rate and the aging population are genuinely concerning. Even if a decline in the population itself may not constitute a serious problem, a situation in which the number of elderly citizens is increasing and the number of children is declining is the worst situation possible for the country. In addition, even if the number of children begins to increase, we will still face a major problem if the number of elderly citizens continues to increase. And in fact, the number of Japan's elderly is continuing to increase. The numbers are not increasing so steeply in western nations, but they are in Japan.

The argument that our present situation does not represent a serious problem refers only to the population. If

the present situation continues, Japan will not be able to ensure enough workers unless people work until 75 years of age.

**Makihara:** As Associate Professor Yanagawa pointed out, I also think it is interesting that despite the fact that downsizing is taking place, many people discuss the situation based on statistical data obtained during the high growth period and consequently overlook many underlying issues. Probably, Dr. Demeny is saying that we should discuss things that happen when the population, macro data, decreases. If the issue of voting is one of the things to be discussed, I think the economic data of the unemployment rate should also be included.

**Demeny:** The nations, where the situation is similar to or more serious than Japan, may include South Korea and China. I think southern Europe is also in a similar situation. The obvious phenomenon these nations will face is that providing the current pension-based standard of living to elderly people is not sustainable.

I said a little while ago that we should focus not on the families with one or two children, but on families with three or four children. I think we can go beyond that and consider a managerially feasible approach that combines pension rights with the number of children and their economic performance as adults.<sup>2</sup>

---

<sup>2</sup> Paul Demeny, "Re-Linking Fertility Behavior and Economic Security in Old Age: A Pronatalist Reform." *Population and Development Review*, Vol. 13 (1987),

Such an approach would include supporting people who developed very productive workers and reallocating rights to them, maybe from those who do not have children. This approach will allow us to consider more about an incentive that provides support in old age for those who have given birth to a child, raised the child to become a productive citizen, and thereby contributed to the working age population.

### **Reform means to give serious consideration to future generations**

**Makihara:** Niall Ferguson, a scholar of economic history at Harvard Business School, said in a recent interview that politics tend to become unstable in nations with a large youth population. He then pointed out that Japan before World War II in the 1930s was just in that situation. He suggested that the recession and the presence of a large number of young people gave birth to complaints, which in turn led to the war. In fact, I think that the fact that there is no war has somehow contributed to the current low birth rate. In modern times, Japan periodically had a war, for which the nation needed young people and adopted the policy that focused not on the population structure, but more on increasing the number of children.

---

pp. 128-139.

People also accepted the policy to meet the needs of the times and did not pay much attention to the situation in their old age.

However, we still use the term “postwar,” which I think is a phenomenon unique to Japan. Even now in 2010, we seem to still talk about or view today in terms of “postwar” or from the vantage point of 1945. It seems that we do not see what lies ahead. Our historical sense is not prospective, but rather retrospective, and the turning point that has given rise to such a mindset, I think, was 1945. When we can believe that Japan will continue to act in the international community in a stable manner, we may be able to envision our future from a prospective perspective.

**Yanagawa:** I think that an economic structural change will be the driving force that brings change to our mindset, although political awareness also has some impact on it. Moreover, in former times, not so many factors existed that would have a great impact on future generations. In recent years, however, factors that will eventually affect the next generation or future generations are increasing, such as the pension system and large-scale public investment, which remain in full force and effect for many years to come. Despite such a change, decisions have always been made without giving serious consideration to the next generation.

**Ushio:** This is an issue that is quite specific to Japan.

**Yanagawa:** I think we are paying the price now for not having built a system that incorporates consideration for future generations. I have researched papers on how political economic systems should be built now for the sake of future generations. I found many different views, and an enormous amount of research has been conducted on how we can build a system that restrains the current generation from making inappropriate decisions or that facilitates decision-making that will be highly evaluated by future generations, although we all know that there is no single perfect answer. In Japan, however, not much discussion has been conducted on this type of political system. I think the time has come for us to build a system that provides opportunities for us to seriously discuss and address the matter.

**Ushio:** After the Cold War, the European nations and the United States experienced significant changes: East and West Germany were unified; the EC increased its membership, leading to the formation of the EU; and the United States established the U.S. dollar as the world's key currency, increased its military power, and formed NAFTA. Japan, however, did not experience a post-cold-war transformation. Enamored of its past achievements, Japan made only minor adjustments. As Professor Makihara indicated, Japan is still maintaining a variety of social welfare and other systems created during its era

of rapid economic growth. Although Japan attempted to introduce substantial reforms, as exemplified by the *Doko Rincho* (Ad Hoc Commission on Administrative Reform), the nation ultimately failed to overcome vested interests. Why did Japan fail to make major reforms under its own power after the Cold War? Is Japan a nation that can accomplish nothing without help from outside?

**Makihara:** I think that real public awareness toward and commitment to Japan's globalization emerged only after the Koizumi cabinet was formed. Many immigrants and tourists came to Japan, which worked to lower the barriers to its borders and accelerate Japan's globalization. In such a social context, institutional reforms became a national agenda during the Koizumi cabinet, but they soon faded away. To achieve a breakthrough in this situation, we should consider how Japan should respond to globalization and how it is going to transform systems to those that cater to the need for globalization. What contributes to solving the problem of the low birth rate is not to implement every measure possible, but to change Japanese society. Since Japan has a tendency to change all at once at certain points, I think it is important to witness how energy for such a drastic change builds up, so I am not pessimistic about Japan's transformation.

**Yanagawa:** We Japanese do not have much experience of having many people

with mindsets different from ours around us. While we became aware of such people around the time of the Koizumi Reform, such awareness has not taken root in us.

**Makihara:** For the development of such awareness, it is essential that the number of foreigners increases at the community level. I think that as we live with people other than Japanese, we will be able to envision what the next era would look like for Japanese or for people living in Japan.

**Yanagawa:** That discussion is interesting. The issues of immigrants and globalization are often discussed in relation to productivity and measures for the low birth rate. However, I think what Professor Makihara just pointed out will also have a significant impact on our awareness of institutional reform.

### **Let's address the issue of the low birth rate anew.**

**Demeny:** Japan seems not so enthusiastic about solving the issue via immigration policies. While 2 million foreigners currently live in Japan, in Singapore, 1 million people out of the entire population of 5 million are immigrants from overseas. If the ratio of immigrants to the population in Singapore were applied to Japan, the number of immigrants in Japan would be 25 million. I think many Japanese would not welcome such a situation or it would be beyond their imagination.

Therefore, I propose that the precondition for the new generation in Japan will not be immigrants overseas, but Japanese born in Japan. To this end, the birth rate should be raised to about 1.8, a level that will not cause major problems for Japan. I think this rate can be applied to the current situation in Japan; I mean the adjustment is feasible. However, if the birth rate remains the same or continues to decline, Japan will face a critical situation.

**Ushio:** The discussion that Dr. Demeny has shared with us today has been particularly thought-provoking, and has significant implications for the reform of Japan in the 21st century. Building on the areas of focus that we have discussed today, NIRA will continue to address the issue of globalization and long-term strategies for Japan that consider the next and future generations.

In closing, I would like to extend my gratitude to all of our participants today for sharing their stimulating and informative views. Thank you very much.

(Conducted on March 10, 2011)

Note:

1 "Pronatalist Policies in Low-Fertility Countries: Patterns, Performance, and Prospects." *Population and Development Review*, Vol. 12 (1986), pp. 335-358.

\* Dr. Demeny's visit to Japan was paid for by a research subsidy that the Center for International Studies, Institute of Economic Research,

Hitotsubashi University, received from the Ministry of Education, Culture, Sports, Science and Technology for the project on Economic Analysis of Intergenerational Issues: Searching for

Further Development (Grant-in-Aid for specially promoted research. Project Number: 22000001).

## “Give children the right to vote”

**Paul Demeny** Distinguished Scholar, The Population Council

### Alarming situation in Japan

While Japan is one of the top nations to have succeeded in lowering the mortality rate, its total fertility rate (the number of children one woman gives birth to in her lifetime) remains around 1.3, which stands out among nations with large populations in that it has failed to maintain the birth rate at the appropriate level. According to the United Nations, the population of Japan will reach 117 million in 2050, which means a decline in population by 25.3 million over the next four decades. Whereas the percentage of old people relative to the entire population is increasing each year, that of children aged 15 years or younger is decreasing.

Japan’s demographics show a pattern featuring a drastic decline in the total population and rapid and accelerating aging. The rapid decline in the working age population will impose an immense burden on Japan’s economy and society. This is a concern that Japan should seriously address. Some Western nations have successfully managed declining populations by accepting immigrants, despite the fact that their birth rates are lower than the levels to maintain their populations. However, the historical background of Japan seems to suggest that the Japanese people will not choose this solution. If that is the case, the only solution left is to raise the birth rate.

### Policies Japan should adopt

Over the past 40 years, having a child has become a disadvantage in terms of cost-benefit considerations in all developed countries across the world. In light of the distribution of income or wealth, young people are at a disadvantage, and there exist intergenerational disparities.

Modern welfare states have promoted policies that mitigate child-care expenses and help women maintain a balance between work and child rearing. The effects of these support schemes, however, have been limited. It is because their national welfare systems are designed to give exceptionally generous support to elderly people, and the budget allocated to these schemes was insufficient. If a greater amount of the budget is secured for them, the

intergenerational disparities would be corrected and the effects of the schemes would be enhanced.

In politics, however, this type of budget distribution is not popular. Therefore, the alteration of such a mindset and the drastic revision of rules that govern politics are desired. To this end, we need to give rise to an active national debate and thoroughly discuss the issue of intergenerational disparities that has long been avoided as taboo.

#### Claim 1: Give children the right to vote

For younger generations, the long-term survival of society is an issue that directly affects their future into the 22nd century. The right to vote granted to children can be implemented by their parents or guardians. By doing so, we can correct the current election system, where the elderly account for the majority of voters, to some extent.

**Claim 2: Give an additional pension to parents according to the number of children**  
Since child rearing is expensive, we should give an additional pension to parents in recognition of their service.

**Claim 3: Provide families with small children compensation equivalent in amount to the salary one of the parents might receive when working outside the home.**

Rearing more than two children requires one person to be a full-time parent. And, it is also expensive. Therefore, I think we should provide these families compensation equivalent in amount to a salary that one of the parents might receive when working outside the home.

\* For details, please refer to *Economy Class: Give children the right to vote* in the morning edition of the *Nikkei* newspaper issued on March 11, 2011.

## Profiles of Participants

### **Paul Demeny**

Dr. Demeny obtained a Ph.D. from Princeton University where he specialized in demography. After serving as Professor of Economics, University of Michigan, he was the founding director of the East-West Population Institute of the East-West Center, University of Hawaii. In 1973, he became Vice President of the Population Council, New York, and Director of its Center for Policy Studies. Since 1989 he serves as Distinguished Scholar at the Council. Dr. Demeny is the founding editor of the journal *Population and Development Review*, now in its 37<sup>th</sup> year.

### **Reiko Aoki**

Dr. Aoki graduated from the School of Science, University of Tokyo, and received a Ph.D. in economics from Stanford University. Her specialized fields are industrial organization and applied microeconomic theory. After serving as an assistant professor at Stony Brook University, State University of New York; visiting assistant professor at Tel-Aviv University; and an associate professor in the Department of Economics, University of Auckland, she has been a professor at the Institute of Economic Research, Hitotsubashi University since 2006.

### **Izuru Makihara**

Mr. Makihara graduated from the Faculty of Law, University of Tokyo, where he specialized in politics and public administration. After serving as a visiting fellow at the London School of Economics and Political Science and as an assistant professor at the Graduate School of Law, Tohoku University, he has been a professor at the Graduate School of Law, Tohoku University since 2000. His books include *Cabinet Politics and Domination by the Finance Ministry* (Naikaku Seiji to “Ookurashou Shihai” ) (Chuokoron-Shinsha, Inc. 2002), which received the Suntory Academic Award.

### **Jiro Ushio**

Mr. Ushio is the chairman of the NIRA and chairman of Ushio Inc. He served as the president of the Junior Chamber International, representative director of the Japan Association of Corporate Executives, the chairman of KDDI Corporation, and a member of the Council on Economic and Fiscal Policy.

### **Noriyuki Yanagawa**

Dr. Yanagawa is a member of the board of the NIRA. He graduated from the Faculty of Economics, Keio University, and received his Ph.D. from the University of Tokyo. His specialized field is contract theory and financial contracts. After serving as an assistant professor at the Graduate School of Economics, University of Tokyo, he has been an assistant professor at the same graduate school since 2007. His books include *Economic Analysis of Law and Corporate Behavior* (Ho to Kigyo Kodo no Keizai Bunseki) (Nikkei Inc. 2006).