THE STRUCTURE AND DETERMINANTS OF TRUST: THE CASES OF JAPAN AND SWEDEN*

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Abstract

The structure and determinants of trust are analyzed using questionnaire data from a sample of Japanese and Swedish university students. A salient characteristic of this analysis is that it considers various dimensions of trust. There are similarities and differences between the

two countries in the relative magnitude of trust belonging to those dimensions. Family trust does not reduce various kinds of trust. It can be inferred from the responses of economics students that education and culture are important determinants of trust. Those who rely heavily on signals for trust decisions are less cooperative and less trustworthy. Some interpretations are given.

Keywords: Trust, Family, Economics Education, Questionnaire, Games
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I. *Introduction*

Trust is today's growing research topic in many social sciences, although serious discussion has just started in economics. The reason it has been almost ignored or at most sporadically discussed in economics is that mainstream economics or neo-classical economics has assumed contract completeness. It has assumed that the behavior of each transaction partner can be controlled by signing a contract that specifies what he/she should do in every future contingency.

Because of this assumption, each economic agent in neo-classical economics faces no uncertainty as to the behavior of his/her transaction partner, although he/she faces uncertainty as to the future state of nature. In this sense, all economic agents are perfectly trustworthy and there is no need to discuss trust in neo-classical economics.

In contrast to this paradigm, contracts are incomplete in the real world because of the existence of transaction costs. It would require astronomical transaction costs in many contracts to specify the partner's behavior for trillions of possible future contingencies. The employment contract between a firm and a typical white-collar worker is a good example. It would be impossible to contract every move of such a worker in every second for the period of, say, three years.

If a contract is incomplete, the partners might behave at their own discretion in some contingencies. This could harm each partner, generating a prisoners' dilemma situation. In short, contract incompleteness gives rise to interdependency between the partners. (In some contracts, only one party might behave at its own discretion and thus harm only the other party.)

It is in such situations that trust and trustworthiness become necessary. Indeed, it should be noted that almost all real-world contracts are incomplete to some extent. Thus, at least an amount of trust and trustworthiness is essential in virtually all transactions as well as in human relations and social relations in general. Without them, inefficiency would arise. We believe it is in this sense that Zand (1972), Arrow (1974), and Fox (1974) pointed to the importance of trust for efficiency in their pioneering works.

If trust and trustworthiness are indispensable for efficiency, it is natural to ask whether they exist in the real world. Some researchers have considered this matter using responses to attitude survey questions from the General Social Survey (GSS), such as "Generally speaking, would you say that most people can be trusted or that you can't be too careful in dealing with people?" Other researchers have undertaken their own questionnaires using similar

questions.

One of the authors of this paper has previously expressed skepticism about using such questions, because meaningful research cannot be conducted without specifying who is to be trusted and the object or content of trust (Arai, 2000). At nearly the same time, Glaeser, Laibson, Scheinkman, and Soutter (2000) expressed criticism of using the GSS results, saying that while these survey questions are interesting, they are also vague, abstract, and hard to interpret.

This paper is a modest departure from traditional analyses based on the questions similar to that cited above from the GSS. The basic purpose of this paper is to analyze the structure of trust and the factors that generate trust. Our analysis is based on a common questionnaire given to students in Japanese and Swedish universities. A feature of our analysis is that it considers many kinds or dimensions of trust including trust in human beings and institutions. Another is that it partly relies on ideas from game theory to measure trust.

An advantage of the common questionnaire is that it enables us to compare the structures of trust and the factors generating trust in Japan and Sweden. Some researchers such as Casson (1991) and Fukuyama (1995) show a great interest in these countries regarding the role that trust plays there. The two countries are also characterized by a relatively great number of large private firms, which develop only in high-trust countries (Fukuyama, 1995).

Knack and Keefer (1997) say, "We find trust and civic norms are stronger in nations with higher and more equal incomes, with institutions that restrain predatory actions of chief executives, and with better-educated and ethnically homogeneous populations." The two countries satisfy these conditions to a large extent. Therefore, it is of interest to analyze similarities and differences in trust in these two high-trust countries.

Section 2 discusses methodological problems inherent in attitude surveys such as the GSS and the characteristics of the method used in this paper. Section 3 introduces several dimensions of trust into our analysis, and then shows that there are similarities and differences in the structure of trust between Japan and Sweden. Some explanations for these salient differences are proposed.

Section 4 analyzes the effects of trust in human beings, especially trust in the family, on various kinds of trust. It is shown that, against the claims of many trust researchers, trust in one's family does not tend to reduce trust in other relationships. In fact, it actually increases some kinds of trust in Japan and Sweden. Trust in friends has a similar but stronger effect. Explanations for these differences are proposed.

Section 5 investigates how education affects trust in general by focusing attention mainly on economics students. It is demonstrated that economics students show more selfish attitudes than other students in standard game situations, but they are not particularly less trustful in other social aspects. We give a clear-cut reason for this, emphasizing the importance of education, inculcation, and culture in determining trust levels.

Section 6 discusses "signals" for trust decisions. It is demonstrated that those who rely more on such signals as occupation and academic background when making trust decisions are actually less trustworthy or less cooperative. Concluding remarks follow in Section 7.

II． *Methods and Material*

A large part of the empirical literature on trust has focused on the well-known trust question cited above from the GSS.[1] Indeed, widespread use of this question has been self-reinforcing. Since its inception a host of other survey studies have adopted the same or slightly modified versions of the question as their primary measure of general or interpersonal trust.[2]

The strength of this growth in surveys and studies employing the same indicator of trust is, of course, that it enables a variety of comparisons. From repeated measuring, we know how trust among people has changed over time in several countries and how trust in other people varies across countries.[3]

Recently, however, the GSS and other general surveys of trust are being criticized on good grounds by Foley and Edwards (1999), Arai (2000), Glaeser *et al*. (2000), and Tsujinaka (2002).

For instance, Arai (2000) insists that responses to such surveys depend heavily on the culture in which the respondents live. Those in cultures that do not expect much of others might answer that most people are trustworthy. Moreover, some cultures might induce the respondents to pretend to be more trusting in order to stand out as good citizens. Above all, the object of trust needs to be specified for meaningful comparisons.

Glaeser *et al*. (2000, p.815) point out that variations in responses might arise for numerous reasons: e.g., differences in beliefs about the trustworthiness of a common set of people; differences in interpretation of who comprises "most people;" differences in interpretation of what it means to be able to trust someone; or differences in the ability to elicit trustworthy behavior from other people.

These criticisms provide useful information about how to measure trust more correctly. Most importantly, questions need to be specific about who is to be trusted. In addition, the object or content of trust needs to be clear; the definition of trust must be unambiguous.

With these points in mind, we have devised a set of forty-nine questions to measure various kinds of trust. We use the following definition of trust: Individual A's trust in individual (institution) B is A's subjective probability that B will keep his/her (its) promise or, if no promise is made, follow what is considered socially accepted norms.[4] All questions in our questionnaire and our analyses below are based on this definition.

Approximately half of the questions stipulate what it means to trust someone by specifying a norm (promise), whereas the rest of the questions leave the contents of trust open for interpretation. The questions are specific enough to take account of the multidimensionality of trust, by which we mean that an individual can direct his/her trust towards various other individuals as well as many kinds of institutions and their representatives.[5]

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[1] For overviews, see Foley and Edwards (1999), Levi and Stoker (2000), and Newton (2001).

[2] Apart from various nationally based surveys the most prominent examples include the World Value Survey, International Social Survey Programme, and European Social Survey.

[3] See Putnam (1995, 2000), Inoguchi (2000), Delhey and Newton (2003), Holmberg and Weibull (2002), and Freitag (2003).

[4] See Arai (2000) for more detail.

[5] See Hardin (1998), Ullmann-Margalit (2002), and Hetherington (1998) for interesting discussion as to the notion of trust in institutions.

The survey data to be analysed in this paper come from two separate investigations undertaken in 2005 using university students in Japan and Sweden. They are based on the same questionnaire with strict anonymity but use different sampling methods.

The Japanese data were collected by distributing the questionnaire at a few different economics classes at Hitotsubashi University and Kanagawa University in the Tokyo metropolitan area (some non-economics students were included). The Swedish data were obtained by sending out the questionnaire to all the undergraduate students in four departments (economics, political science, law, and engineering) at Uppsala University using the email-lists including all relevant students.

Almost all Japanese students who were present in the classes answered the questionnaire, while the overall response rate in Sweden was 29.0%. Because some students did not answer all questions, the sample sizes for the following analyses vary, but on average, the combined sample contains about 300 Japanese and 620 Swedish students.

III. *Dimensions of Trust*

In order to express various dimensions of trust, we included in a factor analysis all forty-nine variables corresponding to the above forty-nine questions. This resulted in a solution of twelve clearly interpretable dimensions. On the basis of these results we have devised twelve distinct indices of trust.[6]

Three of the indices are concerned with trust in human beings, i.e., trust in family members (Famlyt), trust in friends (Friendt), and trust in other people or general trust (Generalt). The remaining nine indices are concerned with institutional trust, i.e., trust in political institutions (Politicalt), trust in the police and courts (Justicet), trust in large banks and corporations (Companyt), trust in trade unions (Uniont), trust in the mass media (Mediat), trust in health care (Healtht), trust in universities (Universityt), trust in elementary schools (Schoolt), and trust in the royal family (Royalt). These twelve indices are used as important trust variables in the following analyses.

Although multidimensionality is introduced into our analysis, the many problems mentioned above still remain regarding measuring trust. In particular, there is no guarantee that the same country mean of trust stands for nearly the same expectations of behavior or activities in the two countries. In addition, the methods of data collection are different as mentioned above, which tends to generate various differences in responses. There are also cultural problems of how people respond to questionnaires.[7] Moreover, the respondents might not have sufficient objective information. For these reasons, it is not very meaningful to compare directly the absolute trust levels computed from the data in the two countries.

A more meaningful measure of trust for (international) comparisons can be derived by considering the relative magnitude of trust of each dimension among all dimensions. Another

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[6] Each index is computed as the average score across those variables loading on a specific factor. All in all, forty-four variables were used to create the indices. The five variables that were excluded did not consistently load on the same factors in separate factor analyses in Japan and Sweden, respectively.

[7] For example, Japanese people tend to show reluctance to choose alternatives containing words of stress such as 'very' (Omori and Yonezawa, 2002). Further, people in some countries tend to overstate their good behavior by giving desirable responses.

is the ranking of the level of trust of each dimension among all dimensions.

For these reasons, in the following discussions, we mainly consider the relative magnitudes of the above-mentioned trust variables (indices). More precisely, the value of each trust variable in Japan (Sweden) is expressed as the deviation from the Japanese (Swedish) grand or overall mean of all forty-nine variables measuring trust.

Table 1 reports the mean deviation scores of the twelve trust variables (indices) for Japan and Sweden. The number in the parentheses after each mean score stands for the ranking of the mean of that variable. The last column indicates whether or not the differences in the mean deviation scores between the two countries are significant.[8]

It is evident in the table that family and friends are the most trusted in both countries. Hence, there is no difference in how students in the two countries trust people with whom they have committed relationships.

Very surprising are the results for Generalt. The ranking of the mean of this variable is fifth for Japan but ninth for Sweden. The difference in the mean between Familyt and Generalt is 2.98 for Japan, but it is 4.53 for Sweden. Hence, Japanese students trust individuals in general relatively more, while Swedish students trust even the royal family and trade unions more than individuals in general. These findings are not congruous with those presented by Yamagishi and Yamagishi (1994) and Yamagishi (1998), who, regarding the difference in trust between Japan and the USA, insist that general trust is lower in the former.

Another remarkable difference is concerned with health care provision. Trust in doctors is much higher in Sweden than in Japan according to the responses to the questions, which use the well-known economic concept of physician-induced demand.[9] In addition, doctors in public practice are more trusted than those in private practice in Sweden, while the difference is negligible in Japan, although this is not shown in the table.

This is an example of the effects an institution has on the trust in those who are involved in the institution. Institutions are a very important determinant of the level of trust (Arai, 2000). The Swedish health care system has resisted the recent pressures of budget retrenchment and is still highly supported by the public authorities. This enables public hospitals to provide medical services at relatively low prices and simultaneously to guarantee salaries to their doctors and other medical workers.[10] Physician-induced demand is less likely to arise under such a system. Hence the higher trust in Swedish doctors in public practice.

In contrast, Japanese medical services are provided mainly by private clinics and hospitals. Doctors in public hospitals do not seem to gain especially high trust, probably because they are not particularly more competent than those in private clinics and hospitals. Moreover, the relative scarcity of public hospitals gives rise to long patient waiting lists. Another conceivable reason is that the vast number of medical doctors in the Tokyo metropolitan area in itself lowers the respect for medical practitioners. Finally, the high

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[8] The rank order correlation (Spearman's ρ) between Japanese and Swedish variables in Table 1 is 0.57 and significant only at the 0.10 level. This fact confirms the interpretation given below: There are overall similarities in the deviation scores with some notable exceptions such as general trust and trust in health care provision.

[9] The questions as to health care provision are: 1) "To what extent do you think that medical doctors in *private* practice apply excessive tests or treatments for their own benefit?" 2) "To what extent do you think that medical doctors in *public* practice apply excessive tests or treatments for their own benefit?".

[10] The individual fees for health care (public as well as private) have been kept low in Sweden, whereas they have risen sharply in Japan (Kato and Rothstein, 2006; Svensson *et al.,* 2006).

TABLE 1.   DIMENSIONS OF TRUST

Variable Name (Variable descriptions are simplified.)	Japanese mean	Swedish mean	Signifi-cance
Familyt (2 questions) *How much can you trust your parents and your family?*	3.42 (1)	3.56 (1)	
Friendt (4 questions) *How much can you trust your best friend, male & female classmates, and your neighbors?*	1.45 (2)	1.33 (2)	
Generalt (4 questions) *Do you think that neighbors try not to make any noise? How likely are you to get a purse back that you left at a restaurant, that someone will support you if you express an objection to the majorities' ideas, and that someone will support you if you blame a person for leaving a drink can on a public space?*	0.44 (5)	−0.97 (9)	***
Politicalt (8 questions) *Do prime ministers, public officials, members of parliament consider their own benefits rather than the country's? Do political parties aim at winning the election or act in the benefit of the country? How much can you trust the government/cabinet, the public administration, the parliament, and the political parties?*	−1.87 (12)	−1.10 (10)	***
Justicet (4 questions) *To what extent are the police helpful and the courts decisions just? How much do you trust the police and the courts?*	0.46 (4)	0.73 (6)	***
Companyt (4 questions) *To what extent do big banks treat costumers equally and large companies fulfil their public duties? How much can you trust big banks and big companies?*	−0.12 (8)	−1.74 (11)	***
Uniont (2 questions) *To what extent do trade unions consider their own benefit rather than the members'? How much can you trust trade unions?*	−0.58 (10)	−0.68 (8)	
Mediat (4 questions) *To what extent are TV news and newspapers biased? How much can you trust radio & TV and newspapers?*	−0.58 (9)	−2.02 (12)	***
Healtht (2 questions) *To what extent do doctors in private/public practice apply excessive treatments for their own benefit?*	−0.86 (11)	1.14 (3)	***
Universityt (6 questions) *Do teachers grade students fairly and make concerted efforts in teaching? Do universities produce competent people and useful research? How much do you trust the university, your teacher, and the administrative personnel at your department?*	−0.02 (7)	1.07 (4)	***
Schoolt (2 questions) *To what extent can you trust elementary school teachers to do their best? How much can you trust elementary schools?*	0.50 (3)	0.87 (5)	***
Royalt (2 questions) *To what extent do the members of the royal family do their best to improve Japan's/Sweden's image? How much can you trust the royal family?*	0.11 (6)	0.21 (7)	

* singnificant at 10%; ** significant at 5%; *** significant at 1%

average income of general practitioners is probably a reason why they are less trusted. This seems to hold both in Japan and in Sweden. Generally speaking, average people do not trust rich people.

The difference in the magnitude of trust in the mass media between the two countries is also worth commenting upon. The mean of the relative magnitude of Mediat is very small and its ranking is the lowest in Sweden. The relative magnitude is also negative in Japan, but the ranking is higher. The fact that Japan has many large companies competing in this industry is probably one important reason for the higher trust. The oligopolistic position of a few large Swedish companies in this industry could be a source of distrust. In addition, for the past several years, there have been fierce debates in Sweden about possible biases involved in the information provided by the mass media, especially the newspapers.

Lastly, there are striking and interesting differences in attitudes towards markets and politics between Japanese and Swedish respondents. In Japan, the ranking of (the mean of) Politicalt is the lowest, while that of Companyt is eighth. In contrast, Companyt is the second lowest and Politicalt is the third lowest in Sweden. The relative magnitude of the mean of Politicalt is comparatively greater for Sweden than for Japan.

It is widely known that Japanese politicians have failed to gain trust of general citizens. This is partly because many of them have had closer ties with the financial circles due to costly elections and partly because the present political system does not fit the Japanese culture well. In contrast, Swedish politicians have traditionally been considered to be closer to the common citizens because they have been elected predominantly from traditional grass-root organizations, mostly connected to the Labor Movement or farmers' interest organizations.[11] Incidentally, there have been few world-famous politicians in Japan, but there have been some in Sweden.

The relatively high trust that Japanese respondents have in large companies derives from several sources. First, Japan has many world-famous corporations. Second, Japan has produced many competent entrepreneurs and managers ever since the Edo period. Third, many Japanese companies have customer-first policies. Fourth, large Japanese corporations have offered high job security under the lifetime employment system (Arai, 1996; Thelen and Kume, 1999). Fifth, equality among employees has been one of the most important values in large corporations.

Attitudes towards large corporations depend greatly on one's ideological views in Sweden. Only trust in the government, unions, and large corporations among all Swedish social institutions is affected by ideological position (Holmberg and Weibull, 2004, p.65). The left-right dimension still dominates political life in Sweden and (to many citizens) big companies represent "capital." The Swedish managers and business elite are considered to be in the upper class and quite remote from general citizens (SOU, 1990, p. 44).

In addition to this, there has been a lot of discussion about the social responsibility of big companies in the process of outsourcing jobs to foreign countries. Many Swedish people do not think nowadays that Ericsson, Volvo, and so forth are really interested in taking social responsibility. The fact that traditional Swedish companies are now owned by foreigners might

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[11] Trust in politicians has decreased considerably in Sweden over the last decades (Holmberg and Weibull, 2004, p.56). Although Swedish politicians are as distrusted today as in many other countries, there is still firm trust in the democratic function and procedures (Möller, 2000, p.55).

have increased this suspiciousness.

These examinations show that there are several important factors that generate trust even in the above limited cases. Institutions are very important, as can be seen from the general fact that individuals tend to trust others more under a better legal system. Also important are the activities and competence of the agent or institution at issue. It is necessary in this respect that people have sufficient information. In addition, the culture or values people possess greatly influence trust levels.

It is interesting to remark in Table 1 that those institutions that enjoy above-average levels of trust are all supported by the public authorities, while those that enjoy below-average levels of trust tend to be managed by private organizations. (Note that we are not considering here Familyt, Friendt, or Generalt.) The individuals related to Politicalt are mainly public servants, yet politicians are not employees but independent individuals seeking self-interest.

This angle enables us to understand why the signs of the means of Healtht and Universityt are different between Japan and Sweden. Medical services and higher education services are provided mainly by private organizations in Japan but mainly by the public authorities in Sweden.

People in Japan and Sweden seem to put more trust in public rather than private institutions. It should be noted, however, that public control is not a sufficient condition for higher trust. Casson (1991) points out that the bureaucracy of the governments in the Eastern Europe failed to gain people's trust. Several factors such as motivation, finances, and monitoring systems determine trust levels.

It should be noted further that trust itself is not the ultimate goal of society. A more important goal is efficiency. Privatization of firms may reduce trust (or trustworthiness) but increase efficiency. As pointed out in the introduction, however, trust also tends to generate efficiency. The effect of privatisation on efficiency should be assessed on the basis of elaborate theoretical models and detailed empirical analyses.

IV. *The Effects of Trust in Human Beings on Various Kinds of Trust*

1. Trust in Human Beings and Institutional Trust

We now apply regression analyses to our data to investigate more extensively what factors determine the levels of various kinds of trust. We start with an analysis of the effects of Familyt, Friendt, and Generalt on the other trust variables mentioned above and some additional variables introduced below. The trust made up of Familyt, Friendt, and Generalt will be sometimes called trust in human beings for short in the following. We are especially interested in the effects of Familyt because there is a well-known claim that strong trust in the family reduces trust in general.

Granovetter (1973) insists that strong ties, breeding local cohesion, lead to overall fragmentation, while weak ties, often denounced as generative of alienation are indispensable to individuals' opportunities and to their integration into communities. Typical examples of strong ties are kinship and intimate friendship, while those of weak ties are acquaintanceship and shared membership in secondary associations. According to Granovetter, it is not strong but weak ties that link members of different small groups for the common good.

TABLE 2a.   THE EFFECTS OF FAMILY TRUST ON INSTITUTIONAL TRUST: JAPAN

Dependent variable:	Politicalt	Justicet	Companyt	Uniont	Mediat	Healtht	Universityt	Schoolt	Royalt
Female	0.0350	−0.3355	−0.0531	−0.0222	0.0828	0.1461	−0.0911	−0.3072	0.1497
	(0.19)	(1.50)	(0.28)	(0.13)	(0.43)	(0.63)	(0.48)	(1.21)	(0.49)
Birthyr	−0.0086	0.0136	0.0032	0.0102	0.0269*	0.0021	0.0329**	−0.0102	0.0388
	(0.57)	(0.75)	(0.21)	(0.73)	(1.74)	(0.11)	(2.12)	(0.50)	(1.56)
Birthctry	0.2374	−0.1222	−0.3494	0.6702	−0.4068	−0.0913	0.2732	−0.7772	−0.5619
	(0.48)	(0.21)	(0.69)	(1.47)	(0.80)	(0.15)	(0.54)	(1.16)	(0.69)
Rural	−0.0002	0.2087	0.0065	0.0181	−0.1282	0.0101	−0.0146	0.0853	0.4345**
	(0.00)	(1.55)	(0.06)	(0.18)	(1.12)	(0.07)	(0.13)	(0.56)	(2.37)
Motherctry	0.2002	1.4861	0.3787	−0.0790	−1.6532	−1.6425	1.0972	−0.0781	−1.2265
	(0.15)	(0.89)	(0.27)	(0.06)	(1.17)	(0.96)	(0.77)	(0.04)	(0.54)
Fatherctry	−1.1387	−2.7079	−1.5110	−0.8538	1.4434	2.3940	−2.6929*	0.0192	1.6188
	(0.77)	(1.50)	(0.99)	(0.62)	(0.94)	(1.28)	(1.75)	(0.01)	(0.66)
Mothered	0.0301	−0.0354	0.0166	−0.0899**	−0.0464	−0.0341	−0.0114	−0.0545	0.0256
	(0.65)	(0.64)	(0.34)	(2.08)	(0.97)	(0.59)	(0.24)	(0.88)	(0.34)
Fathered	−0.0012	0.1082**	−0.0421	0.0702*	0.0018	−0.0706	−0.0339	0.0394	−0.0081
	(0.03)	(2.13)	(0.96)	(1.79)	(0.04)	(1.34)	(0.78)	(0.69)	(0.12)
Member	−0.1099	0.6197	−0.2055	−0.0150	−0.4129	0.6062	0.1509	0.4753	0.4160
	(0.19)	(0.87)	(0.34)	(0.03)	(0.68)	(0.83)	(0.25)	(0.60)	(0.43)
Familyt	0.0974**	0.1868***	0.0514	0.0486	0.0380	0.0098	0.1220***	0.2075***	0.2780***
	(2.15)	(3.41)	(1.09)	(1.15)	(0.82)	(0.17)	(2.61)	(3.37)	(3.72)
Econ	−0.5347*	−0.0914	−0.2769	0.1438	0.1716	0.8981**	−0.3818	−0.3279	−0.4751
	(1.73)	(0.24)	(0.87)	(0.49)	(0.54)	(2.26)	(1.19)	(0.78)	(0.93)
Constant	−1.2270	−0.6037	1.7788*	−0.6772	0.0821	−0.9924	1.1649	1.1264	−2.2031
	(1.26)	(0.51)	(1.77)	(0.75)	(0.08)	(0.82)	(1.16)	(0.85)	(1.37)
Observations	303	307	303	304	306	306	307	306	307
R-squared	0.04	0.10	0.06	0.04	0.04	0.04	0.09	0.06	0.07

Absolute value of *t* statistics in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%

Similarly, Putnam (1993) emphasizes that dense but segregated horizontal networks sustain cooperation within each group, but networks of civic engagement that cut across social cleavages nourish wide cooperation. Following these ideas, Yamagishi (1998) persistently accuses families of breaking trust in general.

In line with this idea, La Porta, Lopez, Shleifer, and Vishny (1997) use international cross-section data to support Fukuyama's (1995) argument that trust in the family has a negative effect on the growth of firms. These authors believe that trust in the family tends to reduce trust in general, which is essential for the formation of large organizations.

If the above researchers' assertions are true in Japan and Sweden, the effects of Familyt on the variables for institutional trust must be negative. We first test this hypothesis. Table 2a shows the OLS regression results for this test for the Japanese data.

In this table, the top nine independent variables in the leftmost column are the control variables. Female is a dummy variable that takes on 1 if the respondent is female and 0 otherwise. Birthyr and Birthctry stand for the student's birth year and country of birth, respectively. Rural is a variable that takes on 1 if he/she is from an urban area, 2 if from the suburb of a big city or from a smaller city or a town, and 3 if from a rural area.

Motherctry (Fatherctry) is a dummy variable that takes on 1 if the student's mother

TABLE 2b.   THE EFFECTS OF FAMILY TRUST ON INSTITUTIONAL TRUST: SWEDEN

Dependent variable:	Politicalt	Justicet	Companyt	Uniont	Mediat	Healtht	Universityt	Schoolt	Royalt
Female	0.1761	−0.1784	−0.1741	0.8229***	0.1152	0.0292	0.0428	0.4169***	−0.0457
	(1.32)	(1.19)	(1.21)	(4.52)	(0.88)	(0.19)	(0.39)	(3.10)	(0.22)
Birthyr	−0.0191	0.0102	−0.0444*	−0.1018***	−0.0319	−0.0632**	0.0156	0.0330	0.0895***
	(0.89)	(0.41)	(1.92)	(3.45)	(1.50)	(2.47)	(0.88)	(1.52)	(2.71)
Birthctry	0.5664*	0.1878	0.2532	0.1641	−0.0346	0.1263	0.1662	0.3675	−0.0738
	(1.92)	(0.57)	(0.80)	(0.41)	(0.12)	(0.36)	(0.68)	(1.24)	(0.17)
Rural	0.1107	0.1193	0.0087	0.0079	0.1836**	0.0335	0.0746	0.1515*	0.0052
	(1.22)	(1.19)	(0.09)	(0.06)	(2.09)	(0.31)	(1.01)	(1.67)	(0.04)
Motherctry	−0.2273	0.3195	0.2409	−0.0127	−0.0946	−0.0865	−0.3053	−0.1163	0.2598
	(0.96)	(1.21)	(0.94)	(0.04)	(0.40)	(0.31)	(1.53)	(0.48)	(0.72)
Fatherctry	0.1637	0.2202	−0.3281	−0.3186	0.2276	0.3045	−0.0092	0.4478*	0.4285
	(0.66)	(0.81)	(1.23)	(0.95)	(0.94)	(1.06)	(0.05)	(1.83)	(1.15)
Mothered	−0.0247	−0.0190	−0.0039	−0.0420	−0.0344	−0.0143	0.0025	0.0375	0.0307
	(0.92)	(0.62)	(0.13)	(1.14)	(1.30)	(0.45)	(0.11)	(1.37)	(0.74)
Fathered	0.0136	−0.0173	−0.0430	−0.0634	0.0337	−0.0133	−0.0195	−0.0442	0.0182
	(0.54)	(0.54)	(1.40)	(1.63)	(1.20)	(0.40)	(0.83)	(1.54)	(0.41)
Member	1.2122***	0.2311	−0.3934	0.3460	0.6049**	0.4442	−0.2024	0.0844	−0.6280
	(3.98)	(0.68)	(1.21)	(0.84)	(2.03)	(1.25)	(0.81)	(0.28)	(1.37)
Familyt	0.1994***	0.3834***	0.1583***	0.0907	0.0633	0.2543***	0.2152***	0.2166***	0.2674***
	(4.20)	(6.98)	(3.09)	(1.40)	(1.37)	(4.50)	(5.48)	(4.52)	(3.67)
Econ	0.6960***	0.1872	0.7335***	0.3600	1.0222***	0.3452	0.1982	0.5619**	−0.5293
	(2.82)	(0.69)	(2.79)	(1.07)	(4.28)	(1.19)	(0.99)	(2.30)	(1.42)
Constant	−2.4906***	−1.2398	−0.5212	2.5134**	−2.2277***	1.5801*	0.1578	−1.8451**	−3.8281***
	(3.17)	(1.40)	(0.62)	(2.34)	(2.86)	(1.69)	(0.24)	(2.32)	(3.15)
Observations	609	621	620	627	615	630	628	627	626
R-squared	0.08	0.09	0.05	0.08	0.06	0.05	0.06	0.07	0.04

Absolute value of t statistics in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%

(father) was born either in Japan or in Sweden and 0 otherwise. Mothered (Fathered) stands for the mother's (father's) number of years of education.

Member measures how much the student is involved in various types of organizations. More precisely, it measures by a score between 0 and 1 how many of the following types of organizations he/she belongs to: political parties, interest organizations, solidarity organizations, religious organizations, student organizations, and lifestyle organizations. If he/she belongs to none, his/her score is 0. If he/she belongs to all types, it is 1.

We have already defined Familyt. Econ is a dummy variable that takes on 1 if the student's major is economics and 0 otherwise. The effects of this variable are analyzed in Section 5. The dependent variables used for the regressions in Table 2a are displayed in the top row. (Similar notes also apply to other similar tables.)

We notice that all the estimated nine coefficients of Familyt are positive and five of them are statistically significant. The results for Sweden shown in Table 2b are more striking: All estimated coefficients of Familyt are positive and seven of them are significant. Therefore, trust in the family actually tends to increase rather than reduce trust in various types of institutions.

Related to Familyt is Friendt, which includes trust in best friends, typically strong ties, as well as trust in classmates and neighbors, which can be categorized as weaker ties. On the other

TABLE 3a.   THE EFFECTS OF FRIEND TRUST AND GENERAL TRUST
ON INSTITUTIONAL TRUST: JAPAN

	Politicalt	Justicet	Companyt	Uniont	Mediat	Healtht	Universityt	Schoolt	Royalt
Friendt	+ *	+ ***	+ ***	+ **	+ ***	+	+ ***	+ ***	+ **
Econ	−	−	−	+	+	+ **	−	−	−
Generalt	+	+ ***	+ ***	−	−	−	+ ***	+ **	+ ***
Econ	−	+	−	+	+	+ **	−	−	−

* significant at 10%; ** significant at 5%; *** significant at 1%

TABLE 3b.   THE EFFECTS OF FRIEND TRUST AND GENERAL TRUST
ON INSTITUTIONAL TRUST: SWEDEN

	Politicalt	Justicet	Companyt	Uniont	Mediat	Healtht	Universityt	Schoolt	Royalt
Friendt	+ ***	+ ***	+ ***	+ ***	+ ***	+ ***	+ ***	+ ***	+ ***
Econ	+ ***	+	+ ***	+	+ ***	+	+	+ **	−
Generalt	+ ***	+ ***	+ ***	+ ***	+ ***	+ ***	+ ***	+ ***	+ ***
Econ	+ ***	+	+ ***	+	+ ***	+	+	+ **	−

* significant at 10%; ** significant at 5%; *** significant at 1%

hand, Generalt measures trust in people with whom one has much weaker ties. Do Friendt and Generalt have stronger relationships with trust in various types of institutions than Familyt?

Tables 3a and 3b are compiled to investigate this question. The sole difference between these new tables and the previous two are that Familyt is replaced with either Friendt or Generalt in these and the new tables are simplified to show only the signs and statistical significance of the effects of the independent variables other than the control variables.

These new tables demonstrate that, in general, Friendt has stronger relationships with institutional trust than Familyt both in Japan and Sweden. On the other hand, the effects of Generalt are nearly the same as those of Familyt in Japan and almost the same as those of Friendt in Sweden. Hence, generally speaking, Friendt and Generalt have slightly stronger relationships with institutional trust than Familyt. In all, these results do not support the negative effects of family trust on various kinds of trust.

2.   Trust in Human Beings and Game Results

Next, we turn to the effects of trust in human beings on the responses to the questions relating to some types of experimental games. The questionnaire asked a few questions about the strategies the respondent would choose if faced with these games. This was supposed to reveal the respondents' cooperativeness, trustfulness, and trustworthiness.

One type of experimental game we used is the standard public-good game. The question had the following wording:

> Suppose there is a group of ten members who live in the same city (town) but have met for the first time. Someone gives 100 chips to each member, who is allowed to divide them between those for private use and those for public use. One chip for private use is

exchanged for 100 yen, while one chip for public use is exchanged for 250 yen. Each member can keep all the money obtained through private use. On the other hand, the amounts of money generated through public use by the ten members are pooled into a common fund. The total amount in this fund is then distributed equally to the ten members. Thus, if one member contributes 100 chips to public use and the other nine members contribute none to public use, each of the ten members will receive 2500 yen from the fund irrespective of his/her contribution to public use. (In the Swedish version, 100 yen was replaced by 10 kronor.) If you were a member of this group, how many chips would you contribute to *public* use?

The variable made from the response to this question is supposed to measure the cooperativeness or public spirit of the respondent. We name it Coop.

Another type of experimental game we used is the standard trust game. The setup of the game was presented as follows:

Individuals A and B are going to play a game, which can be described as follows: A is given 10,000 yen and is requested to divide it into two amounts (including zero), one for A and the other for B. A can keep the amount divided for A. On the other hand, the amount A gives to B is tripled, and B will receive the tripled amount. For example, if A takes 1,000 yen and gives 9,000 yen to B, B will receive 27,000 yen. Then, B is allowed to return a portion (including zero) of what he has received as an expression of thanks. The final payoff of A will be the sum of the amount initially A took and the amount B returned, while that of B will be the amount he held after returning a portion to A. (10,000 yen in the Japanese version was replaced by 1,000 kronor in the Swedish version.)

Then, the following two questions were asked. The first is "If you were A, how much would you give to B (the answer should be the amount *before* it is tripled)?" The variable made from the response to this question is supposed to measure trustfulness, so we call it Trustful. The second question is "Suppose you are B and that you have received 30,000 yen, i.e. A took none. How much would you return to A?" The variable made from the response to this question is supposed to measure trustworthiness, so it is named Trustworth. The values expressed by cooperation, trustfulness, and trustworthiness will be called below trust-related values (of the games) for short.

Tables 4a and 4b show the test results. They indicate first that Familyt does not reduce trust-related values. Indeed, it promotes cooperativeness in Japan, although it has a weak (insignificant) negative effect on Trustful in Sweden. Friendt and Generalt are more strongly related to the trust-related values in the two countries. In fact, the effects of Friendt and Generalt are all positive and significant in Sweden, although the effects for Japan are somewhat weaker.

3.   Interpretations

From these observations, we conclude that high trust in the family does not reduce institutional trust or the trust-related values of the games. Indeed, family trust promotes trust in many institutions and even cooperativeness. This conclusion is in stark contrast to the above-mentioned views by Granovetter (1973) and Putnam (1993). Can we reconcile these

TABLE 4a.   THE EFFECTS OF TRUST IN HUMAN BEINGS ON GAME STRATEGIES: JAPAN

Dependent variable:	Coop			Trustful			Trustworth		
Female	0.3239	1.6452	1.0231	−5.7839	−5.6132	−6.2363	6.5166	6.4831	5.2395
	(0.08)	(0.42)	(0.26)	(1.43)	(1.43)	(1.57)	(1.09)	(1.10)	(0.89)
Birthyr	0.2680	0.2659	0.1622	0.0044	0.0933	−0.0132	0.3820	0.4328	0.3511
	(0.84)	(0.82)	(0.51)	(0.01)	(0.29)	(0.04)	(0.79)	(0.89)	(0.73)
Birthctry	8.2355	6.6527	4.1858	10.2541	8.0413	8.9731	19.6496	18.5442	18.5034
	(0.78)	(0.63)	(0.40)	(0.96)	(0.76)	(0.85)	(1.24)	(1.17)	(1.17)
Rural	−3.0070	−2.9572	−2.8824	−2.4964	−2.3350	−2.7057	2.9247	3.0118	3.3509
	(1.26)	(1.23)	(1.22)	(1.03)	(0.97)	(1.12)	(0.81)	(0.84)	(0.93)
Motherctry	−19.1371	−21.0541	−24.8068	7.8009	8.4856	6.7902	−24.6637	−24.0951	−26.0465
	(0.65)	(0.72)	(0.86)	(0.26)	(0.29)	(0.23)	(0.56)	(0.55)	(0.59)
Fatherctry	−10.4288	−7.3751	4.0591	−29.9036	−26.4242	−23.4811	−10.9077	−9.2159	−5.0423
	(0.33)	(0.23)	(0.13)	(0.92)	(0.83)	(0.73)	(0.23)	(0.19)	(0.11)
Mothered	0.3319	0.3041	0.1456	0.5523	0.4577	0.6429	−0.3464	−0.3994	−0.2340
	(0.34)	(0.31)	(0.15)	(0.55)	(0.47)	(0.65)	(0.23)	(0.27)	(0.16)
Fathered	−0.5422	−0.2881	−0.5564	−0.9810	−0.9044	−1.1617	2.2407*	2.2615*	2.2609*
	(0.61)	(0.32)	(0.63)	(1.07)	(1.01)	(1.29)	(1.65)	(1.69)	(1.69)
Member	−34.7753***	−32.9503***	−33.6937***	7.1390	10.5798	7.6148	12.9855	14.7622	12.1586
	(2.77)	(2.60)	(2.71)	(0.56)	(0.83)	(0.60)	(0.68)	(0.77)	(0.64)
Familyt	1.9646**			−0.1918			−0.2982		
	(2.02)			(0.19)			(0.20)		
Friendt		1.1473			3.4831***			1.8723	
		(0.93)			(2.82)			(1.01)	
Generalt			4.1621***			2.4750*			2.5461
			(3.24)			(1.89)			(1.30)
Econ	−1.3418	−0.3830	1.1661	−0.4592	−0.9038	0.8305	−19.0862*	−19.4301*	−17.9476*
	(0.20)	(0.06)	(0.17)	(0.07)	(0.13)	(0.12)	(1.86)	(1.90)	(1.76)
Constant	58.8790***	59.4160***	61.3033***	76.3593***	66.4454***	72.0227***	122.4096***	116.7190***	114.9237***
	(2.84)	(2.83)	(2.99)	(3.60)	(3.14)	(3.44)	(3.89)	(3.68)	(3.68)
Observations	307	308	306	306	307	305	306	307	305
R-squared	0.07	0.06	0.09	0.03	0.06	0.04	0.04	0.04	0.05

Absolute value of *t* statistics in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%

contrastive views?

Fortunately, yes. The point is that the above two authors are talking essentially about societies with many extended families, such as Italy and China. In such a society, many people can or need to rely on their extended family for important matters in life. They do not need to rely on other people so that cooperation with the latter people does not develop. Indeed, they might try to use the latter people if possible, generating mutual uncooperativeness in society. The same is true of Trustful and Trustworth.

The international cross-section analysis undertaken by La Porta, Lopez, Shleifer, and Vishny (1997) also reflects the effects of large families in some of the sample countries. In other words, even if Familyt has a positive effect on Coop within a small number of countries, it can well have a negative effect in international cross-section analyses. Thus, it is wrong to apply simply what holds in a society characterized by many extended families to Japan as Yamagishi (1998) does.

In contrast to Italy, China, and other countries with many extended families, Japan and

TABLE 4b. THE EFFECTS OF TRUST IN HUMAN BEINGS ON GAME STRATEGIES: SWEDEN

Dependent variable:	Coop			Trustful			Trustworth		
Female	1.0288	0.5772	0.9427	−10.9816***	−11.0073***	−10.6002***	6.0318*	6.8788*	6.9341*
	(0.37)	(0.21)	(0.35)	(4.10)	(4.14)	(3.95)	(1.65)	(1.87)	(1.92)
Birthyr	0.7237	0.7532*	0.4425	0.8841**	1.0426**	0.8509**	0.4354	0.2623	0.0290
	(1.61)	(1.66)	(1.01)	(2.05)	(2.39)	(1.98)	(0.74)	(0.43)	(0.05)
Birthctry	0.3408	0.5011	−1.9618	5.8250	6.6235	8.5046	−5.8686	−5.2076	0.9085
	(0.05)	(0.08)	(0.32)	(0.96)	(1.10)	(1.39)	(0.71)	(0.63)	(0.11)
Rural	1.2870	1.4938	0.8263	−3.8689**	−3.5842**	−4.2189**	2.6693	2.5631	1.9486
	(0.68)	(0.80)	(0.44)	(2.15)	(2.00)	(2.33)	(1.08)	(1.03)	(0.79)
Motherctry	1.1281	1.5115	3.4568	−4.1914	−3.8124	−3.9964	10.4459	10.7882	10.4581
	(0.22)	(0.30)	(0.70)	(0.87)	(0.79)	(0.82)	(1.58)	(1.62)	(1.59)
Fatherctry	5.5393	4.0790	4.8927	5.6493	4.1134	3.8910	7.7651	8.4511	5.4004
	(1.10)	(0.81)	(0.99)	(1.15)	(0.83)	(0.79)	(1.17)	(1.25)	(0.82)
Mothered	−0.2869	−0.2160	−0.1376	0.1278	0.2239	0.1768	−0.4373	−0.3999	−0.5431
	(0.52)	(0.39)	(0.25)	(0.24)	(0.42)	(0.33)	(0.60)	(0.54)	(0.75)
Fathered	−0.6105	−0.7353	−1.0516*	0.5350	0.4040	0.3229	−0.5583	−0.6953	−0.8665
	(1.04)	(1.26)	(1.79)	(0.93)	(0.71)	(0.56)	(0.72)	(0.89)	(1.11)
Member	11.4183*	12.0040*	6.7082	9.0556	10.0282*	8.5239	−12.2171	−12.0417	−13.8746*
	(1.83)	(1.93)	(1.09)	(1.51)	(1.67)	(1.41)	(1.49)	(1.45)	(1.69)
Familyt	0.2813			−1.3410			1.4585		
	(0.28)			(1.39)			(1.11)		
Friendt		2.8399***			2.7481***			3.0939**	
		(3.10)			(3.11)			(2.54)	
Generalt			4.5032***			2.2120**			4.6910***
			(4.85)			(2.40)			(3.78)
Econ	−3.2897	−3.8959	−4.8121	−7.2455	−8.1470*	−7.9130	−19.3427***	−19.6712***	−20.2188***
	(0.66)	(0.78)	(0.98)	(1.51)	(1.70)	(1.64)	(2.93)	(2.96)	(3.10)
Constant	31.1757*	28.6404*	51.0685***	34.1183**	21.4626	34.0153**	124.7283***	129.4425***	147.5580***
	(1.89)	(1.79)	(3.21)	(2.15)	(1.39)	(2.17)	(5.74)	(6.08)	(6.97)
Observations	598	597	593	586	585	582	594	593	590
R-squared	0.02	0.04	0.06	0.06	0.08	0.07	0.04	0.05	0.06

Absolute value of t statistics in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%

Sweden have generally been characterized by small or nuclear families. These two countries seem to be characterized by relatively weak family ties compared with most other advanced countries in the world.

Members of small families cannot rely greatly on their families because such families do not have human resources with various abilities nor wide human networks. Hence, a society composed mainly of small families needs to establish trust-related values.

Of course, there is mutual help even within small families. This might reduce the trust-related values to some extent. For the above reason, however, those families that make much of trust tend to encourage both family trust and trust-related values. The relatively weak effects of Familyt in Tables 4a and 4b can be interpreted as deriving from these somewhat contradictory attitudes of the family.

We see in Tables 4a and 4b that Friendt and Generalt have stronger positive effects on the trust-related values of the games than Familyt. This is reasonable since the former two independent variables are more strongly related to trust in people outside the family.

V. *Economics Education and Trust*

1. Questionnaire Results

Our data enable us to investigate a very interesting issue concerning how economics education affects the students' values related to trust. This issue is interesting not only in itself but also from other viewpoints such as international comparisons and investigations into the factors generating trust and cooperation. There has been a debate for nearly twenty years concerning the hypothesis that economics students are more selfish (less cooperative, trustful, and trustworthy) than other students.

Representative researchers supporting this hypothesis are Marwell and Ames (1981), Carter and Irons (1991), Frank, Gilovich, and Regan (1993, 1996), and Frank and Shulze (2000). In contrast, Yezer, Goldfarb, and Poppen (1996) and Frey and Meier (2003) negate the hypothesis. Some of these researchers use standard experimental games as the basis of their claims, while others base their claims on less formal methods such as a lost-letter experiment and observations of gift giving behavior.

One of the focal issues in this debate has been whether the selfishness of economics students, if it exists, is a self-selection effect (selfish students more often tend to major in economics) or inculcation of economics education. Frank, Gilovich, and Regan (1993, 1996) are typical proponents of the inculcation hypothesis. Blais and Young (1999) may be considered to support it as well, since they emphasize the importance of inculcation by demonstrating that a short lecture on the paradox of voting to students reduces their election turnout due to diminished sense of duty to vote. Kirchgassner (2005) is another who supports this hypothesis. Most of the other researchers above who insist on selfishness of economics students support the self-selection hypothesis.

Our research has the following characteristics regarding this issue. First, our questionnaire is made up of questions based on standard experimental games as well as more informal questions. Thus, we can examine whether or not economics students are less trustful in both. Secondly, our questionnaire covers many kinds of institutional trust and the trust-related values of the games, so it enables us to identify which kinds of trust, if any, economics students lack. Thirdly, since it uses common questions in Japan and Sweden, it can reveal possible cultural and social differences in the responses.

Some of the results have already been shown in the previous section to save space. Tables 2a and 2b reveal the effects of Econ on nine kinds of institutional trust. In the case of Japan, Econ produces significant effects on two kinds of institutional trust, one negative and one positive. In Sweden, it significantly affects four kinds of institutional trust and all these effects are positive. Similar results also hold in Tables 3a and 3b. Therefore, economics students are no less trusting in various kinds of institutions either in Japan or Sweden. Indeed, they are more trustful than other students in Sweden.

Next, we turn to Tables 4a and 4b. A remarkable fact in these tables is that Econ has negative and significant effects on Trustworth in both Japan and Sweden. In Sweden, it has negative and almost significant effects on Trustful as well. Its effect on Coop is also negative in Sweden though insignificant. In Japan, the effects of Econ are mostly negative (the two positive effects are insignificant). Thus, economics students are likely to be less trustworthy

(and less trustful) in these standard experimental games.

2.   Interpretations

The following interpretations can be given to the results shown in the previous subsection. Firstly, economics students tend to behave rationally in many standard experimental games. However, they are not especially less trustful or less cooperative in other situations. Indeed, they are more trustful than other students in many situations. More precisely, economics students are more selfish according to the results shown in Tables 4a and 4b, but they are no less trustful according to the estimates shown in Tables 2a, 2b, 3a, and 3b.

This interpretation also tends to hold for the results reported by the researchers mentioned above. Economics students were no less or were even more trustworthy and cooperative in the studies by Yezer, Goldfarb, and Poppen (1996) and Frey and Meier (2003), mainly because they did not face standard experimental games. Economics students were more selfish when they faced such games in the studies by Marwell and Ames (1981) and Carter and Irons (1991). The questionnaires undertaken by Frank, Gilovich, and Regan (1993) also include such games.

Why do economics students behave more egoistically in standard game experiments? A clear-cut interpretation can be obtained from the results of our questionnaire that has various types of questions for the same individuals. Basically, they have been taught to do so in economics classes or by economics textbooks. Many of them have previously learned some game theory (or economic theory). Their behavior in these experiments tends to be influenced by this knowledge. They know or guess how a rational individual should behave in such a situation and tend to behave as game theory predicts. They think that the questions they are facing are challenges to their intelligence and they want to respond to them by behaving rationally. Some of them might want to show that they are not foolish and know game theory.

In a broad sense, game theory covers the lost-letter problem considered by Yezer, Goldfarb, and Poppen (1996) and the gift giving problem by Frey and Meier (2003). Most students, however, perceive them as matters of ethics rather than games for rational calculus. They tend to behave in such problems according to the ethics they were taught at home or school. This is why economics students can be more cooperative in these situations.

Roughly speaking, three types of situations are conceivable in this respect. One type is concerned with the situations of standard (experimental) games. For the above reasons, economics students tend to behave (think) as game theory predicts. Another type is concerned with situations where explicit games are not present. Examples are situations of whether or not to trust the courts, the mass media, or large corporations. In these situations, economics students are no less trustful than other students.

The third is the type in-between. This type of situation involves games in a broad sense such as gift giving and kindness but not formal standard games in textbooks. In these situations, some economics students behave egoistically and others cooperatively depending on their understanding of ethics and calculus. Experimental or observation results can vary, but the above-mentioned results show that economics students behave quite cooperatively in these situations.

These studies of economics students provide useful insight into how trust or cooperativeness is generated in the real world. They suggest that education at home as well as at school

TABLE 5a.   THE EFFECTS OF SIGNALS ON TRUST LEVELS: JAPAN

Dependent variable:	Coop				Trustful				Trustworth			
Female	2.2480	1.4815	2.3291	2.4220	−5.8888	−6.0307	−5.6460	−5.9414	9.5617	9.4494	8.6723	9.5688
	(0.57)	(0.38)	(0.59)	(0.62)	(1.46)	(1.51)	(1.41)	(1.48)	(1.58)	(1.58)	(1.43)	(1.58)
Birthyr	0.2280	0.2373	0.2391	0.2310	0.0053	0.0097	0.0085	0.0042	0.3776	0.3629	0.3742	0.3846
	(0.72)	(0.74)	(0.75)	(0.73)	(0.02)	(0.03)	(0.03)	(0.01)	(0.77)	(0.74)	(0.76)	(0.78)
Birthctry	7.9465	7.3547	8.1997	7.8123	10.3145	10.1566	10.5169	10.3653	20.1020	20.3152	19.6554	19.4558
	(0.76)	(0.70)	(0.78)	(0.75)	(0.96)	(0.95)	(0.98)	(0.97)	(1.25)	(1.27)	(1.22)	(1.21)
Rural	−3.2938	−2.9601	−3.0249	−3.3449	−2.5031	−2.4400	−2.4477	−2.4861	3.4437	3.5045	3.4207	3.3471
	(1.40)	(1.25)	(1.28)	(1.42)	(1.03)	(1.01)	(1.01)	(1.03)	(0.95)	(0.97)	(0.94)	(0.92)
Motherctry	−22.0703	−21.3273	−20.5732	−22.4789	7.0504	7.2944	7.4178	7.1913	−23.8511	−24.3240	−23.7020	−24.9456
	(0.76)	(0.73)	(0.70)	(0.77)	(0.24)	(0.25)	(0.25)	(0.24)	(0.53)	(0.55)	(0.53)	(0.56)
Fatherctry	−9.2756	−8.4002	−11.5669	−8.7880	−29.2605	−29.2778	−30.2051	−29.4420	−14.0294	−12.8774	−13.0643	−11.8779
	(0.29)	(0.26)	(0.36)	(0.28)	(0.90)	(0.91)	(0.93)	(0.91)	(0.29)	(0.27)	(0.27)	(0.24)
Mothered	0.3574	0.3056	0.3915	0.3959	0.4533	0.4479	0.4900	0.4412	−0.0036	−0.0312	−0.1404	0.0396
	(0.37)	(0.32)	(0.40)	(0.41)	(0.46)	(0.45)	(0.50)	(0.44)	(0.00)	(0.02)	(0.09)	(0.03)
Fathered	0.0726	−0.3021	−0.1832	0.0813	−0.7886	−0.9028	−0.8173	−0.7904	2.7464**	2.9509**	2.6405*	2.6965*
	(0.08)	(0.34)	(0.21)	(0.09)	(0.86)	(0.99)	(0.91)	(0.87)	(2.00)	(2.17)	(1.94)	(1.97)
Member	−31.5218**	−34.2508***	−32.0144**	−31.5495**	6.9812	6.3947	7.2175	7.0063	16.2567	16.3080	15.3243	15.3305
	(2.51)	(2.72)	(2.53)	(2.52)	(0.54)	(0.50)	(0.56)	(0.55)	(0.84)	(0.85)	(0.79)	(0.79)
Signalav	−0.4792				0.1695				−1.6288			
	(0.69)				(0.24)				(1.52)			
Occupation		0.0903				0.3181				−1.8271*		
		(0.15)				(0.50)				(1.93)		
Education			−0.7227				−0.1215				−0.6233	
			(1.16)				(0.19)				(0.65)	
Employer				−0.5815				0.1974				−1.4536
				(0.93)				(0.31)				(1.50)
Constant	57.1658***	62.3938***	60.5498***	56.5495***	73.7693***	75.4213***	73.8589***	73.9526***	90.7971***	87.4991***	93.9414***	90.6809***
	(2.97)	(3.22)	(3.16)	(2.94)	(3.74)	(3.83)	(3.77)	(3.74)	(3.06)	(2.96)	(3.19)	(3.06)
Observations	309	310	310	309	308	309	309	308	308	309	309	308
R-squared	0.06	0.06	0.06	0.06	0.03	0.03	0.03	0.03	0.04	0.04	0.03	0.04

Absolute value of *t* statistics in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1%

is a very important factor generating both. Most people think, expect, and behave as they were taught. Of course, there are other factors, but education, inculcation, and culture play most important roles in generating trust.

Our questionnaire results also reveal that the responses of students are different in Japan and Sweden. Swedish economics students are more rational than their Japanese counterparts as can be seen in Tables 4a and 4b. This fact implies that the effects of education are likely to depend on culture.

We believe that we have clearly explained why economics students behave (think) more rationally than others in standard experimental game situations. A remaining important question is whether people who studied economics behave as game theory predicts in the real world when they perceive that they are facing a situation very similar to that learned in game theory. This is an interesting topic for future research.

TABLE 5b. THE EFFECTS OF SIGNALS ON TRUST LEVELS: SWEDEN

Dependent variable:	Coop				Trustful				Trustworth			
Female	−0.5743	−0.4022	−0.3416	−0.1291	−10.6422***	−10.5685***	−10.4443***	−10.9254***	5.5925	6.0800*	5.6428	6.3801*
	(0.22)	(0.15)	(0.13)	(0.05)	(4.12)	(4.10)	(4.05)	(4.23)	(1.54)	(1.68)	(1.56)	(1.75)
Birthyr	0.7880**	0.7048*	0.7177*	0.8647**	1.0159**	0.9906*	1.0022**	1.0652***	0.5809	0.5460	0.5385	0.6358
	(1.98)	(1.77)	(1.81)	(2.14)	(2.56)	(2.50)	(2.53)	(2.68)	(1.04)	(0.98)	(0.97)	(1.14)
Birthctry	−0.8476	0.5772	−0.4459	0.9091	4.3262	5.3257	4.6714	4.4743	−10.0142	−9.1218	−9.9595	−8.4312
	(0.15)	(0.10)	(0.08)	(0.15)	(0.75)	(0.93)	(0.81)	(0.78)	(1.23)	(1.13)	(1.23)	(1.03)
Rural	1.4108	1.5302	1.3424	1.3756	−2.9489*	−2.9157*	−3.0033*	−2.8825*	3.1102	3.0280	3.0937	2.8914
	(0.80)	(0.86)	(0.76)	(0.77)	(1.69)	(1.67)	(1.72)	(1.66)	(1.26)	(1.23)	(1.26)	(1.17)
Motherctry	3.2135	3.3591	3.0440	2.7422	−3.2151	−3.0779	−3.3646	−2.8941	13.8584**	14.0119**	13.8419**	13.3675**
	(0.70)	(0.73)	(0.67)	(0.59)	(0.71)	(0.68)	(0.74)	(0.64)	(2.16)	(2.19)	(2.17)	(2.09)
Fatherctry	5.4077	4.2245	5.1720	4.2016	6.2015	4.9222	6.1303	5.2325	8.0813	7.7889	7.9659	7.5636
	(1.14)	(0.90)	(1.09)	(0.88)	(1.31)	(1.05)	(1.29)	(1.11)	(1.21)	(1.18)	(1.20)	(1.15)
Mothered	0.0716	0.0832	0.0133	0.1068	0.1843	0.2487	0.1242	0.3298	0.1254	−0.0129	0.1076	−0.0305
	(0.13)	(0.16)	(0.03)	(0.20)	(0.35)	(0.48)	(0.24)	(0.63)	(0.17)	(0.02)	(0.15)	(0.04)
Fathered	−0.5109	−0.6434	−0.4642	−0.7259	0.5051	0.3876	0.5034	0.3785	−1.0169	−1.0142	−0.9477	−1.0824
	(0.92)	(1.16)	(0.83)	(1.30)	(0.91)	(0.70)	(0.90)	(0.68)	(1.30)	(1.30)	(1.21)	(1.39)
Member	14.7069**	14.7917**	15.0020**	15.9239***	7.2658	8.0476	7.7479	9.3248	−10.3790	−11.0937	−10.4821	−10.4379
	(2.49)	(2.51)	(2.57)	(2.68)	(1.24)	(1.38)	(1.34)	(1.61)	(1.26)	(1.35)	(1.28)	(1.27)
Signalav	−2.5197***				−0.6426				−1.9409**			
	(4.21)				(1.08)				(2.32)			
Occupation		−1.8381***				−0.2479				−1.4646**		
		(3.74)				(0.51)				(2.14)		
Education			−2.0366***				−0.3264				−1.7377***	
			(4.49)				(0.72)				(2.74)	
Employer				−1.2755**				−1.0367*				−0.7547
				(2.05)				(1.69)				(0.88)
Constant	23.0518	25.8690*	24.8670*	23.0903	23.6977	24.7387*	24.6938*	21.9867	123.0703***	125.4509***	123.4880***	124.6687***
	(1.58)	(1.77)	(1.71)	(1.56)	(1.63)	(1.71)	(1.71)	(1.51)	(6.02)	(6.17)	(6.07)	(6.07)
Observations	651	655	653	655	636	640	638	640	647	651	649	651
R-squared	0.05	0.05	0.06	0.03	0.06	0.05	0.05	0.06	0.03	0.03	0.04	0.03

Absolute value of *t* statistics in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1%

VI. *Signals for Trust Decisions*

When one decides how much to trust another individual, one might base one's decision on signals the individual transmits, such as his/her occupation and academic background.[12] In this section we analyze how signals for trust decisions function. Our questionnaire study provides interesting facts on this matter.

Tables 5a and 5b show the results of the regression with independent variables for signals as well as the control variables. The dependent variable is either Coop, or Trustful, or Trustworth. The new independent variables measure importance of the signals in trust

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[12] The term "signal" was originally used by Spence (1973) to refer to a source of information, such as academic background, which is useful in judging the ability of other people. The same term is used here for a source of information for trust judgements.

decisions.[13] Occupation is self-evident. Education means the academic background. Employer is the organization employing the person to be trusted. Signalav is the average of these three variables.

First, we examine the case of Sweden shown in Table 5b. We find that all coefficients of these four independent variables are negative and that many of them are statistically significant. In particular, all coefficients significant when the dependent variable is Coop. Most are significant when it is Trustworth. The results for Japan in Table 5a are not as clear, but a similar tendency holds when the dependent variable is Trustworth.

From these results, we conclude that those who rely on the above signals for trust decisions tend to be less trustworthy or less cooperative than others, although there are some differences between the two countries.

This conclusion is interesting but seems reasonable. It could also be counter-evidence against Yamagishi's (1998) claim that those who possess trust-related values are equipped with social intelligence, which enables them to distinguish the trustworthy from the untrustworthy. In actuality, those who rely heavily on signals are more likely to be rational or selfish.

VII.   *Concluding Remarks*

By assuming contract completeness, neo-classical economics has avoided discussion on trust, but almost all contracts in the real world are incomplete, generating the necessity of trust and trustworthiness. This paper has analyzed some important aspects of trust using data collected by a questionnaire to university students in Japan and Sweden. A salient characteristic of this analysis is that it considers various dimensions or kinds of trust. This has generated several findings including the following.

There are similarities and differences in the ranking of the various kinds of trust between the two countries. Generally speaking, publicly supported institutions are more trusted than privately supported ones. Family trust does not reduce various kinds of trust. The existing influential claims against this finding are based on the confusion between extended and nuclear families. Economics students behave rationally in standard experimental games or respond rationally to questions based on standard games because they have been taught to do so in such situations. They are no less trustful in other social respects. This implies that education, inculcation, and culture are very important determinants of trust. Those who rely heavily on signals for trust decisions are less cooperative and less trustworthy. This finding might be counter-evidence against the claim by some psychologists that those who are highly trustful are very cautious in their trust decisions.

REFERENCES

Arai, K. (1996), *Koyo Seido no Keizaigaku* [The Economics of Labor Market Institutions],

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[13] The variables for the signals are derived from the responses to the question, "Suppose you meet a person for the first time. In order to determine how much to trust him/her, to what extent is it important to you to know his/her (a) occupation, (b) academic background, and (c) employer?"

Tokyo, Chuo-keizai-sha.

Arai, K. (2000), "Koyo Seido no Naka no Shinrai [Trust in Labor Market Institutions]," *Keizaigaku Kenkyu* [*Hitotsubashi University Research Series; Economics*] 42, pp.105-155.

Arrow, K. J. (1974), *The Limits of Organization,* New York, W. W. Norton.

Casson, M. (1991), *The Economics of Business Culture,* Oxford, Oxford University Press.

Blais, A. and R. Young (1999), "Why Do People Vote? An Experiment in Rationality," *Public Choice* 99, pp.39-55.

Carter, J. R. and M. D. Irons (1991), "Are Economists Different, and If So, Why?" *Journal of Economic Perspectives* 5, pp.171-177.

Delhey, J. and K. Newton (2003), "Who Trusts? The Origins of Social Trust in Seven Societies," *European Societies* 5, pp. 93-137

Foley, M. W. and B. Edwards (1999), "Is it Time to Disinvest in Social Capital?" *Journal of Public Policy* 19, pp. 141-173

Fox, A. (1974), *Beyond Contract,* London, Farber and Farber.

Frank, G. and G. G. Shulze (2000), "Does Economics Make Citizens Corrupt?" *Journal of Economic Behavior and Organization* 43, pp.101-113.

Frank, R. H., T. Gilovich, and D. T. Regan (1993), "Does Studying Economics Inhibit Cooperation?" *Journal of Economic Perspectives* 7, pp.159-171.

Frank, R. H., T. Gilovich, and D. T. Regan (1996), "Do Economists Make Bad Citizens?" *Journal of Economic Perspectives* 10, pp.187-192.

Freitag, M. (2003), "Social Capital in (Dis)similar Democracies," *Comparative Political Science* 36, pp. 936-966

Frey, B. S. and S. Meier (2003), "Are Political Economists Selfish and Indoctrinated? Evidence from a Natural Experiment," *Economic Inquiry* 41, pp.448-462.

Fukuyama, F. (1995), *Trust,* New York, Free Press.

Glaeser, E. L., D. I. Laibson, J. A. Scheinkman, and C. L, Soutter (2000), "Measuring Trust," *Quarterly Journal of Economics* 115, pp.811-846

Granovetter, M. S. (1973), "The Strength of Weak Ties," *American Journal of Sociology* 78, pp.1360-80.

Hardin, R. (1998), "Trust in Government," in: V. Braithwaite and M. Levi, eds., *Trust and Governance*, New York, Russell Sage, pp.9-27

Hetherington, M. J. (1998), "The Political Relevance of Political Trust," *American Political Science Review* 92, pp.791-808

Holmberg, S. and L. Weibull (2002), "Institutionsförtroende [Institutional Trust]," in: S. Holmberg and L. Weibull, eds., *Det våras för politiken* [Politics are Thriving], *SOM-rapport* [*The Institute on Society, Opinion, and Media Research Series*] 22, Gothenburg, University of Gothenburg Press, pp.35-57.

Holmberg, S. and L. Weibull (2004), *Det nya samhället* [The New Society], *SOM-rapport* [*The Institute on Society, Opinion, and Media Research Series*] 24, Gothenburg, University of Gothenburg Press.

Inoguchi, T. (2000), "Social Capital in Japan," *Japanese Journal of Political Science* 1, pp.73-112.

Kato, J. and B. Rothstein (2006), "Government Partisanship and Managing the Economy: Japan and Sweden in Comparative Perspective," *Governance* 18, [forthcoming].

Kirchgassner, G. (2005), "(Why) are economists different?" *European Journal of Political*

Economy 21, pp.543-562.

Knack, S. and P. Keefer (1997), "Does Social Capital Have an Economic Payoff? A Cross-Country Investigation," *Quarterly Journal of Economics* 112, pp.1251-1288.

La Porta, R., F. Lopez, A. Shleifer, and R. W. Vishny (1997), "Trust in Large Organizations," *American Economic Review* 87, pp.333-338.

Levi, M. and L. Stoker (2000), "Political Trust and Trustworthiness," *Annual Review of Political Science* 3, pp.475-507.

Marwell, G. and R. E. Ames (1981), "Economists Free Ride, Does Anyone Else?" *Journal of Public Economics* 15, pp.295-310.

Möller, T. (2000), *Politikens meningslöshet* [The Meaninglessness of Politics]*,* Stockholm, Liber.

Newton, K. (2001), "Trust, Social Capital, Civil Society, and Democracy," *International Political Science Review* 22, pp.201-214

Omori, T. and A. Yonezawa (2002), "Measurement of Social Capital in Japan," Paper presented at an international conference on the Measurement of Social Capital organized by OECD and the UK Office of National Statistics in London on 25-27 September 2002. [http://www.oecd.org/dataoecd/22/19/2381767.pdf]

Putnam, R. (1993), *Making Democracy Work,* Princeton, Princeton University Press.

Putnam, R. D. (1995), "Tuning in, Turning out: The Strange Disappearance of Social Capital in America," *PS: Political Science and Politics* 28, pp. 664-683.

Putnam, R. D. (2000), *Bowling Alone. The Collapse and Revival of American Community*., New York, Simon & Schuster.

SOU (1990), *Demokrati och Makt i Sverige* [Power and Democracy in Sweden], Stockholm, Fritzes.

Spence, M. (1973), "Job Market Signaling," *Quarterly Journal of Economics* 87, pp.354-374.

Svensson, T, M. Mabuchi, and R. Kamikawa (2006), "Managing the Bank-System Crisis in Coordinated Market Economies: Institutions and Blame Avoidance Strategies in Sweden and Japan," *Governance* 18 [forthcoming].

Thelen, K. and Kume, I. (1999), "The Effects of Globalization on Labor Revisited: Lessons from Germany and Japan," *Politics and Society* 27, pp.477-505.

Tsujinaka, Y. (2002), "Measuring Social Capital: Perspectives from Japan," Paper presented at an international conference on the Measurement of Social Capital organized by OECD and the UK Office of National Statistics in London on 25-27 September 2002. [http://www.oecd.org/dataoecd/2/2/2380346.pdf]

Ullmann-Margalit, E. (2002), "Trust, Distrust, and In Between," in: R. Hardin, ed., *Distrust*, New York, Russell Sage, pp.60-82.

Yamagishi, T. (1998), *Shinrai no Kozo* [The Structure of Trust], Tokyo, The University of Tokyo Press.

Yamagishi, T. and M. Yamagishi (1994), "Trust and Commitment in the United States and Japan," *Motivation and Emotion* 18, pp.129-166.

Yezer, A. M., R. S. Goldfarb, and P. J. Poppen (1996), "Does Studying Economics Discourage Cooperation? Watch What We Do, Not What We Say or How We Play," *Journal of Economic Perspectives* 10, pp.177-186.

Zand, D. E. (1972), "Trust and Managerial Problem Solving," *Administration Science Quarterly* 17, pp.229-239.