JSPS KAKENHI Grant Number 25282040

Survey and Analysis on the Influence of Parents' Conscience over Girls' Course Selection for Science, Technology, Engineering and Math

Report

March, 2016

Yuko Hayashi PhD, Professor, Yamaguchi University, Japan
Hideko Kunii PhD, Professor, Shibaura Institute of Technology, Japan
Ginko Kawano, Professor, Yamagata University, Japan

Preface

Japanese Constitution claims equality for men and women. However, compared to other countries, Japan is very far behind in closing the gender gap. Japan being the 104th ranking out of 142 countries in the figure of gender gap index is unfortunately the reality at the moment. This distortion is a crucial defect for Japan facing the 21st century.

As a result of rapid development of ICT, the GDP of the developing countries came to share 44% of the whole, and for this reason, the business framework is changing dramatically. In order for Japanese to make use of this opportunity and grow by overcoming paradigm shift, industry must be forced to change structurally, and innovation is required.

Innovation is unlikely to happen in a homogeneous culture, and historically, civilized communities are likely to be born in the intersection points of various cultures. Japanese manufacturing industry which is founded upon male oriented society is basically a homogeneous culture. In recent years, the rapid decrease in the working age population has been a serious problem, and the women's participation as a working force in order to expand the total number of working force is demanded. In addition to that, women's work force is expected to become a meaningful heterogeneous human resource to secure in order to promote innovation. In other words, expansion of role and extension of quality.

Since manufacturing is the core industry of Japan, nurturing STEM women is a crucial task for today's economy, and this is the basic background of the theme of our research. Thus this research focused especially on mothers with daughters. A survey was made on the influence of mothers over their daughters proceeding to STEM related faculties as this demand is highly required in the industry. The object is to become a useful source for an effective policy to close the gender gap and to rectify the extremely low rate of girls proceeding to STEM.

We would like to thank the people who contributed to this research including President Sawako Hanyu, vice president Keiko Takano, Professor Akie Naito, and lecturer Rie Hogetu. Furthermore, we would also like to show appreciation to the graduates of Ochanomizu University who cooperated to answer this questionnaire. Some of them even gave us their time for further interviews and that was greatly appreciated.

This report is based upon the result of the research, "Survey and Analysis on the Influence of Parents' Conscience over Girls' Course Selection for Science, Technology, Engineering and Math" in JSPS KAKENHI Grant Number 25282040.

Study Group for Women's Course Selection

March, 2016

Yuko Hayashi PhD, Professor, Yamaguchi University, Japan
Hideko Kunii PhD, Professor, Shibaura Institute of Technology, Japan
Ginko Kawano, Professor, Yamagata University, Japan

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Research Objective and Over View

Research Objective and Back Ground

This survey is part of "Women's course selection" from the "Questionnaire on women's course selection continuing education and leadership" done by the Research Committee on Graduates of Ochanomizu University chaired by vice president of Ochanomizu University Dr. Keiko Takano and was conducted as "Survey and Analysis on the Influence of Parents' Conscience over Girls' Course Selection for Science, Technology, Engineering and Math" which was funded by JSPS KAKENHI Grant Number 25282040.

In spite of the fact that diversity in race, sex, and specialism is required in science and technology field to promote innovation, compared to OECD countries, the number of women who proceeded to STEM University is low in Japan.

This status must be viewed as a problem. Focusing on this phenomenon, we must discover ways to solve it by clarifying the background and the details of the actual condition. So what we did was to conduct a questionnaire survey to the mothers who render great influence over women's course selection and surveyed the mothers' own experience, educational policies over course selection of their children, and consciousness over raising their children in order to clarify the factors that influence them.

In a globalized society, securing human resources from a diversity of groups is of vital importance. In companies where women participate, the work place is activated and the results are improving. (McKinsey & Company, Inc., Women Matter 2010) Compared to other countries, women in Japan do not play an active role in society. According to gender gap of World Economic Forum, Japan is the low rank of 104th among 142 countries. (The Global Gender Gap Report 2014, World Economic Forum (2014)) It is said that if the gender gap is closed, GDP increases. (Daly, Kevin Gender Inequality, Growth and Global Ageing, Goldman Sachs Global Economics Paper No: 154, 2007,APEC2011 Women and Economic Summit) Also, in fields where rapid technology development and innovation are needed, process innovation, product innovation, and service innovation with diversified point of views are demanded. In other words, participation of women is a necessity. There are some cases where products developed by women team have made great success in the market. However, in universities in Japan, the number of women who are supposed to be the matrix of producing STEM women itself is scarce. In the faculty of engineering, it is 9.3%,and in the faculty of science, 26.8%. (the report on Basic Research on School, the Ministry of Education, Culture, Sports, Science and Technology, 2011)

The above situation was an issue in many countries, so in most developed countries, policies for gender equality were promoted. These policies are devised based on scientific evidence, and the great contribution by the survey and research (contract nr.:RTD-PP-L4-2007-1) in Europe Committee done by the collaboration of science researchers and social science researchers is very well known. (Meta-analysis of gender and science research) In Japan, the second and third Gender Equality Basic Plan (2005, 2010) was conducted based upon Basic Law for a Gender-Equal Society (1999). In addition, in the third Science and Technology Basic Plan based upon the Science and Technology Basic Law (2006), active promotion of women researchers was included. In promoting this policy, institutions such as Science Council of Japan (2005), National Universities Association (2000, 2004), and Japan Inter-Society Liaison Association Committee for Promoting Equal Participation of Men and Women in Science and Engineering (EPMEWSE) (2004,2005) conducted surveys and clarified the actual state of women researchers in Japan. Thus, there is the characteristic that the policies over women and science and technology have been assembled by going back and forth between academia and a realistic site. However, these survey was basically targeted toward researchers of all areas, and was not specialized for STEM course selection.

Thereupon, this survey was created to focus on questionnaires for STEM course selection by the mothers: 1) to clarify the influence of the mothers' awareness over education and her experiences in life over the child's course selection, 2) based on 1) , extract the types of mothers who promote their child to go to STEM and mothers who obstruct, 3) based

on 2), to discover how to applicate methods that could be done at home or ways to advise course selection to promote women's STEM course selection.

We hope that the data here will be of use for promoting women to make STEM course selection for useful information background on adequate advices and for future policy decision.

Research Overview

1. Period of survey: Sent the questionnaire in the beginning of February, 2014. The due date was set on the same year, February 21st.
2. Method of survey: Posted the questionnaire
3. Survey target and content: From the graduates enrolled in the OG database of Ochanomizu University (one of women national university), we made an assumption for the generation that could have given high influence over their children on their course selection upon proceeding to universities, and conducted a complete survey over 3772 course graduates between March of 1966 and March of 2005.Return rate was 1966 graduates, 52.1%.

The reasons why we chose Ochanomizu University graduates as our target were, first of all, because we needed to survey the graduates of a university with a long history, not to a recently formed university in order to research the influences of social factors to mothers' consciousness and experiences. By doing so, we were able to target graduates before and after the Equal Employment Opportunity Law was enacted and thus were able to speculate the effects of this law.

Secondly, this university holds both STEM and non-STEM courses along with graduate schools, so the mothers in target would have high consciousness, interests, and diverse learning experiences.

Thirdly, we can control the influence of scholastic performance of the graduates over their child's course selection. According to precedent study, men's course selection has an academic track based upon scholastic performances, while for women, course selection is not depended solely upon academic track but by the level of consciousness of gender role too. (Yuko Nakanishi (1998)" Gender track ") Furthermore, consciousness of gender role as mother's feelings to avoid the daughter's situation as a "Ronin" (to study another extra year to get into her first choice of her university) creates great influence over course selection pattern. (Keiko Yoshiwara, Gender Differentiation in the Process of the Selection of Universities An Analysis of "Tracks" Embedded in the Entrance Examination System, 1998) What we wanted to clarify in this research is the effect of the consciousness and differences of experiences of the mother over the child's course selection. In other words, gender role awareness and differences of experiences based upon that. Therefore, it was necessary to survey a group where the scholastic performances of the mothers were in a relatively similar quality and choosing this university that constantly ranks high on the academic track was an appropriate choice.

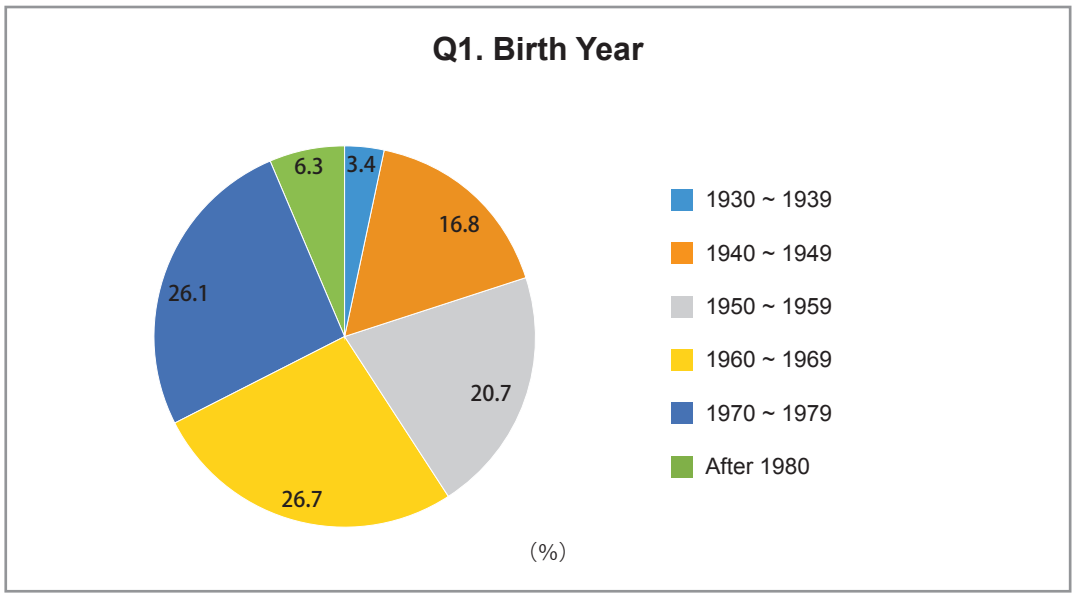
Fourthly, another reason was that we were able to expect a high return rate from the graduates as was proven by the 72% return rate of the survey conducted in the year 2000 by this university.

For the details of the survey, please refer to the attached questionnaire. The content consists of five items; 1) Birth Year and the faculty of the graduates 2) Life style before entering university 3) Carrier and marriage 4) About science and technology 5) Women's way of life.

Part 1 Simple Tabulation of the Questionnaire

1. Birth Year and the faculty of the graduates

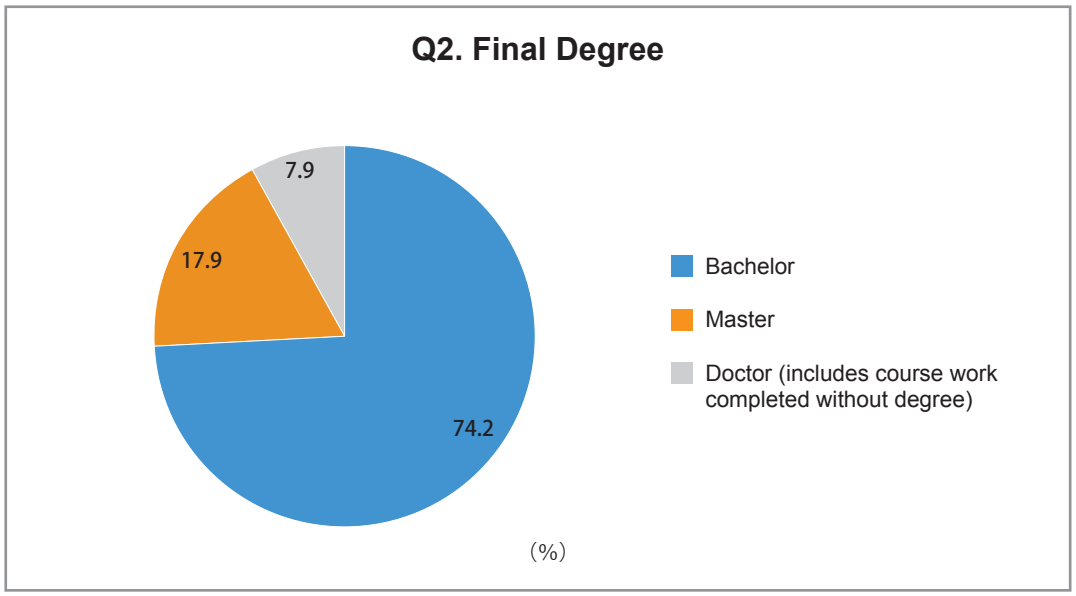
1-1. Birth Year



Years 1960 ~ 1969 is the highest with 26.7%. The next is years 1970 ~ 1979 with 26.1% and years 1930 ~ 1939 is the lowest with 3.95%. The next is after1980 with 6.3%.

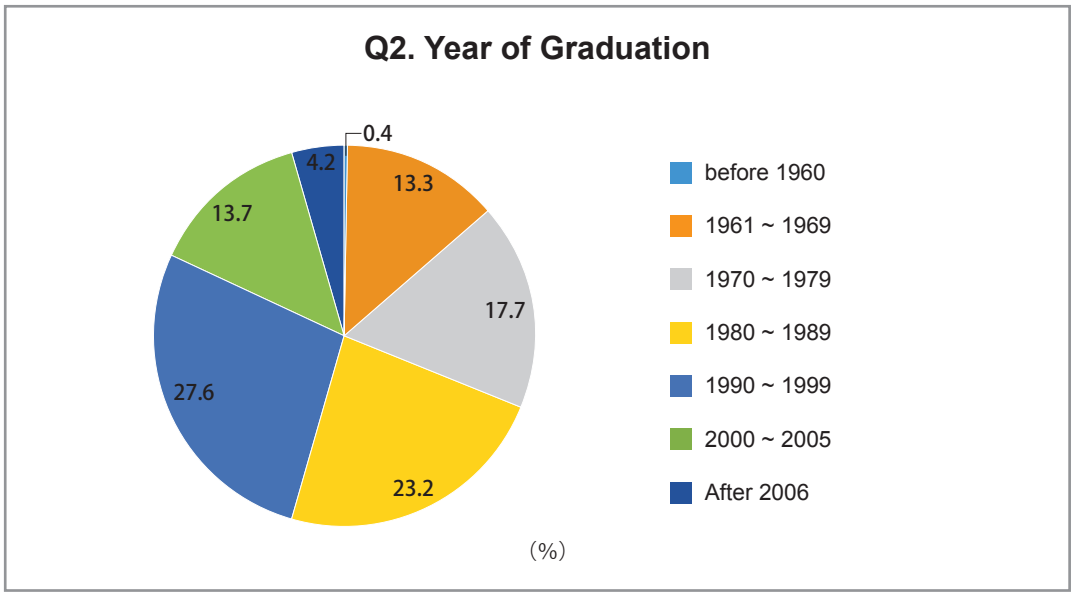
At present, 2015, age group 46 ~ 55 is the highest (26.7%) and this includes the generation that graduated the university in 1986 when the Equal Employment Opportunity Law came to effect. The least percentage is the age group 76 ~ 85 (3.95%) This era has less student compared to present age.

1-2. Final Degree



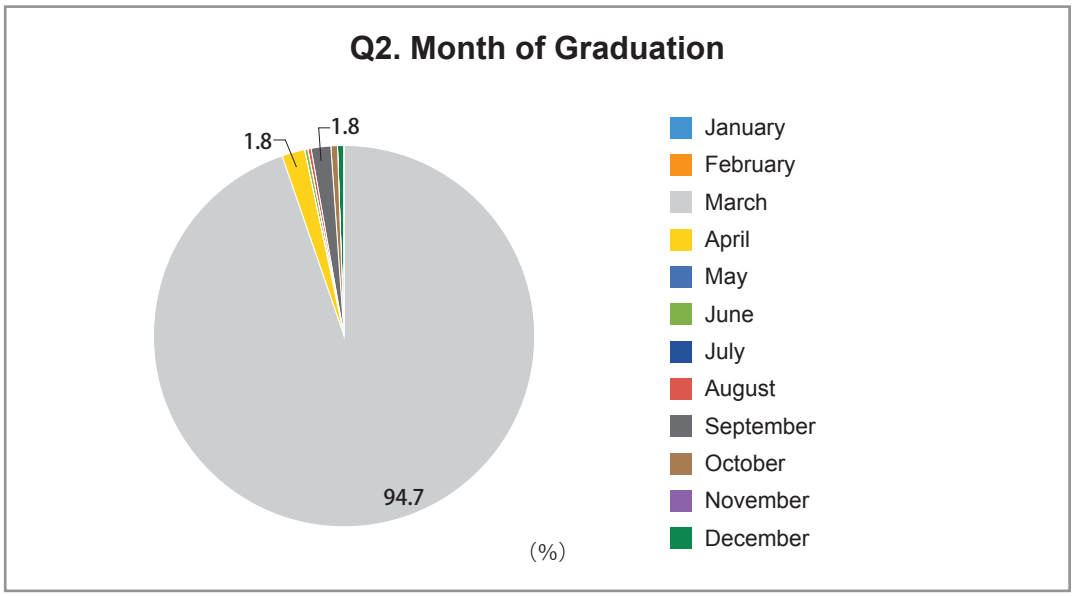
The highest is bachelor degree with 74.2%. The next is master degree with 17.9%, followed by doctor with 7.9%.

1-3. Year of Graduation



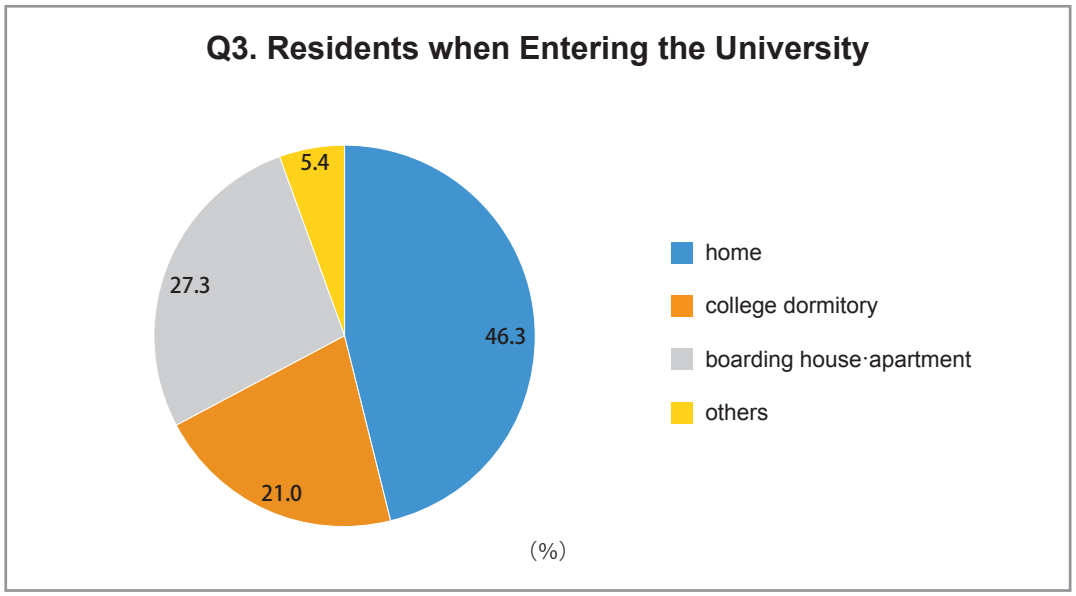
There are the most graduates between the years 1990 ~ 1999 with 27.6%, followed by the years 1980 ~ 1989 with 23.2%. More than half are graduates after1986 when the Equal Employment Opportunity Law came to effect.

1-4. Month of Graduation



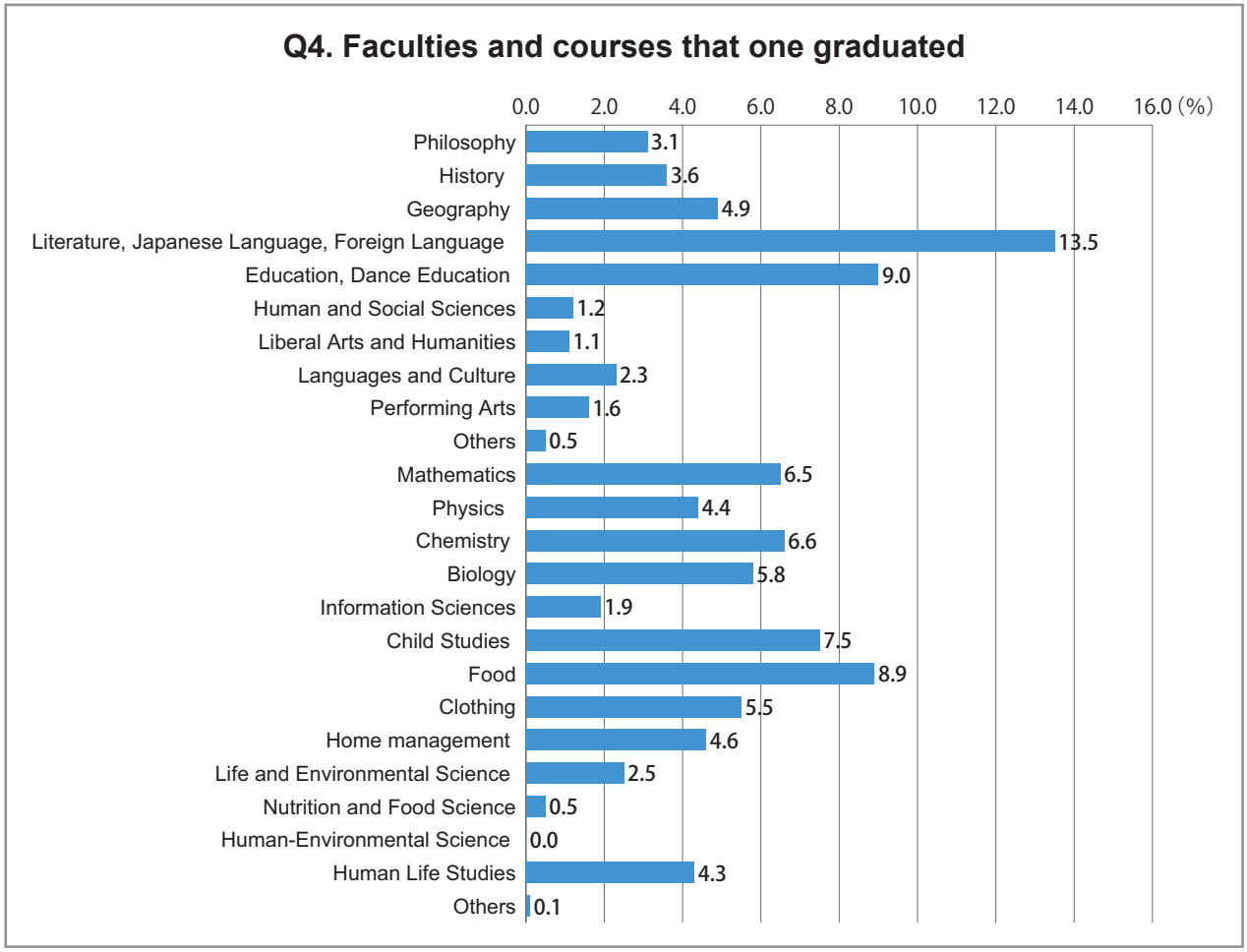
Majority was March graduates with 94.7%, September graduates was few with 1.8%.

1-5. Residents when Entering the University



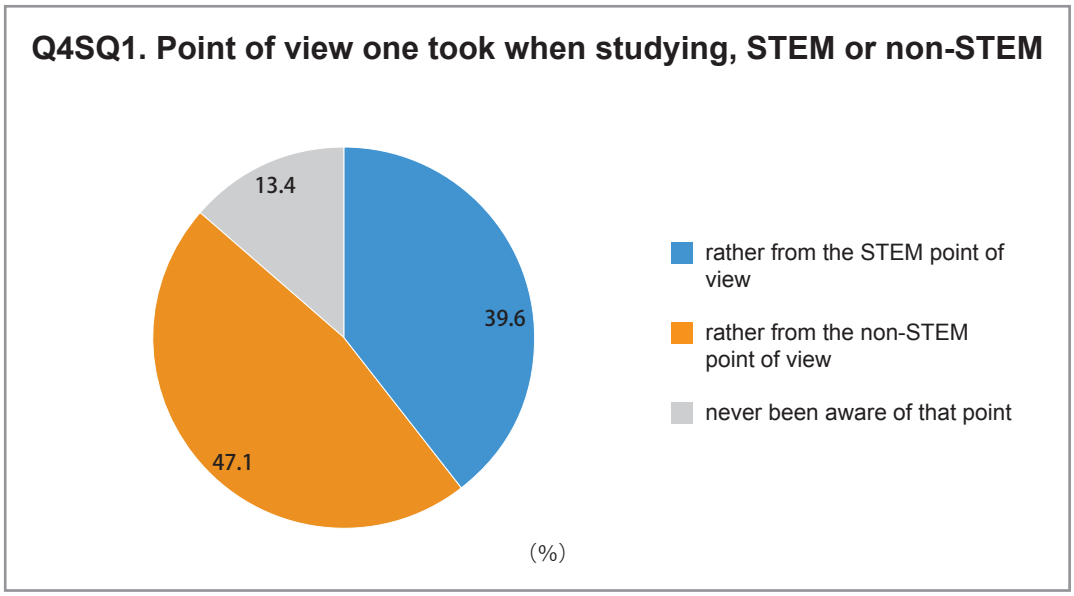
Home is the highest with more than half, followed by shared apartments and college dormitory.

1-6. Faculties and courses that one graduated



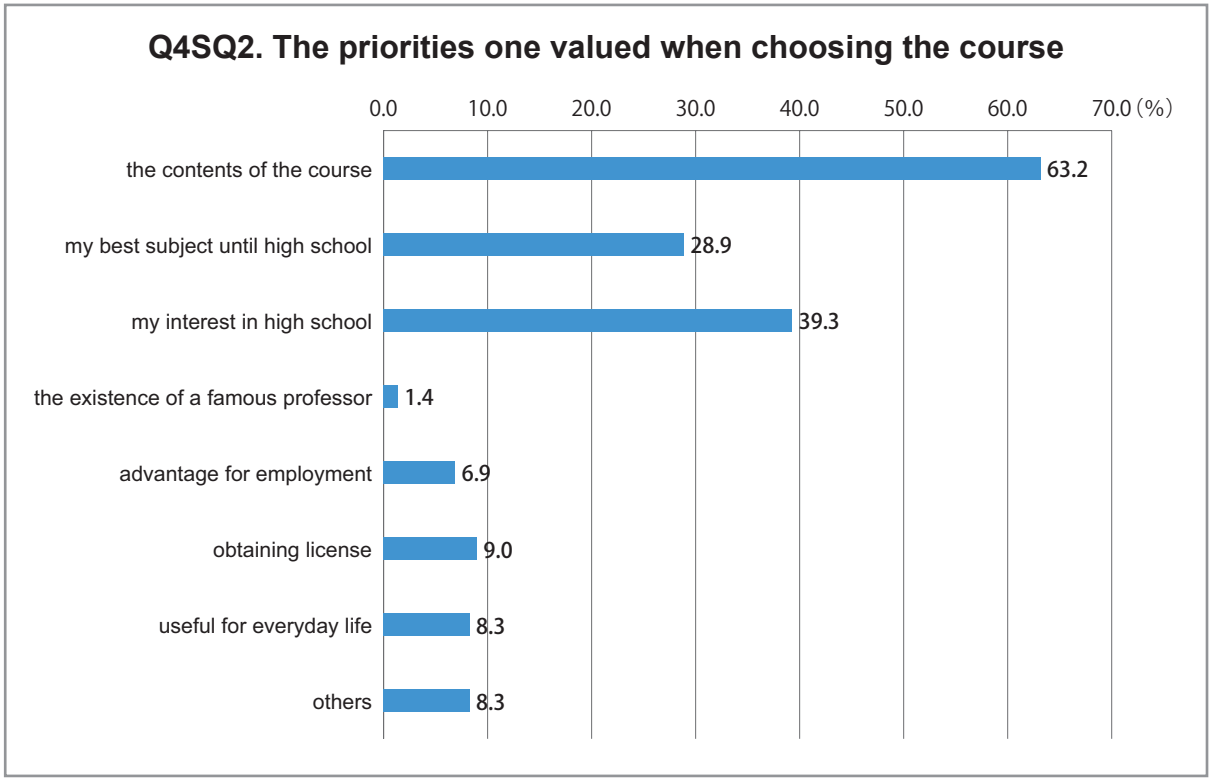
The highest was the course of literature, Japanese language, foreign language with 13.5%, followed by the course of education, dance education with 9.0%. Among the STEM related courses, the course of food was the highest with 8.9%. Concerning the faculty basis, the faculty of letters and education occupied 41%, the faculty of science with 25%, and faculty of home economics and human life and environmental sciences with 34%.

1-7. Point of view one took when studying, STEM or non-STEM



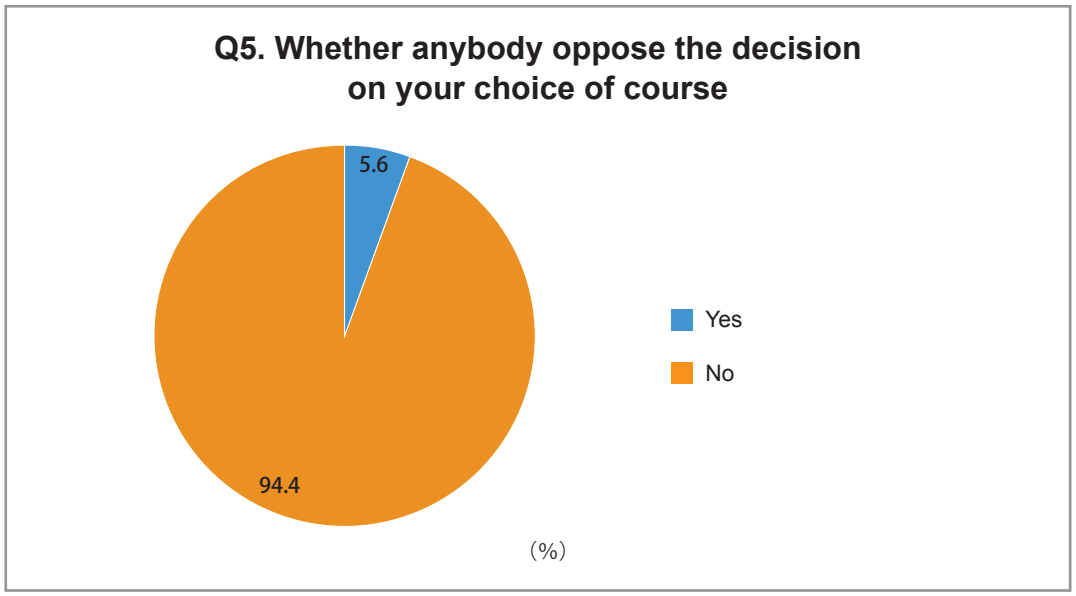
The highest is the non-STEM point of view with 47.1%, 39.5% studied with STEM view.

1-8. The priorities one valued when choosing the course



The highest is “the contents of the course” with 63.2%, followed by “My interest in high school” with 39.3%, and “my best subject until high school” with 28.9%. Many chose the fields of faculty in university that they were interested in rather than what they were good at.

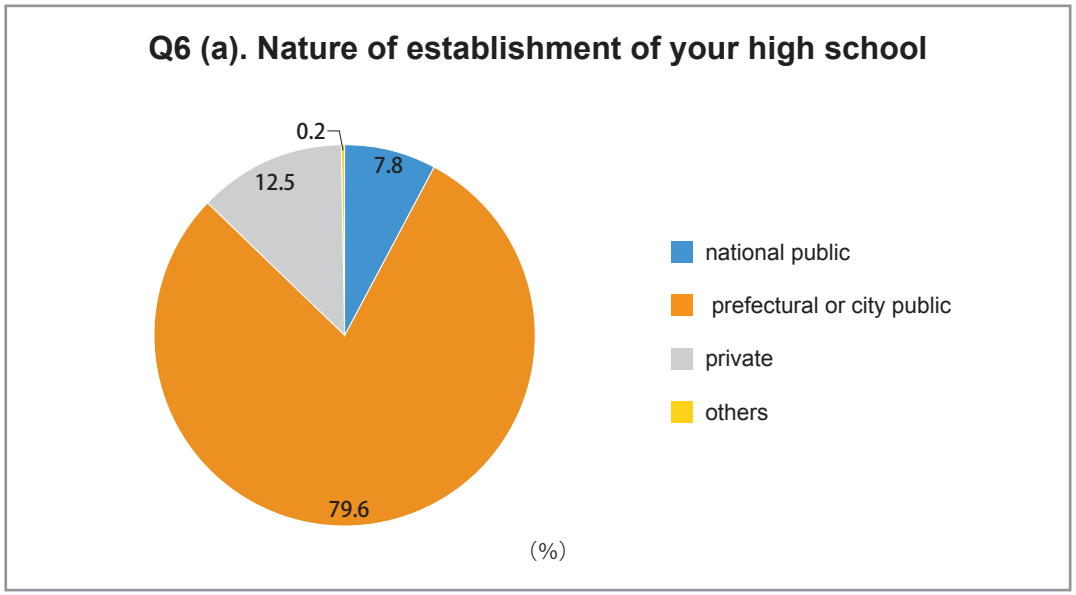
1-9. Whether anybody oppose the decision on your choice of course



94.4% of the people chose the course without meeting opposition.

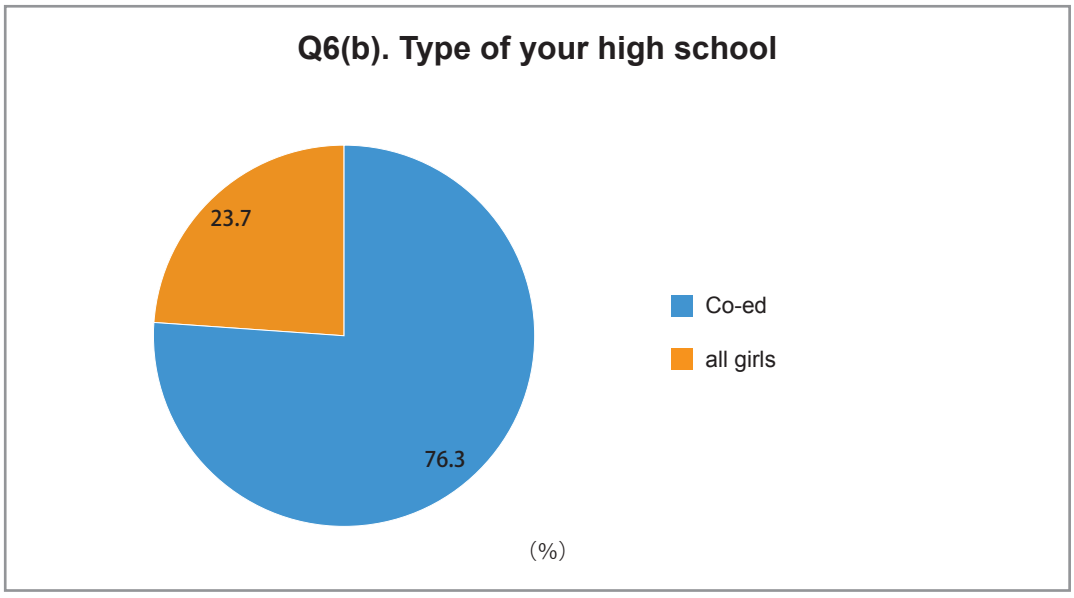
2. Life style before entering university

2-1. Nature of establishment of your high school



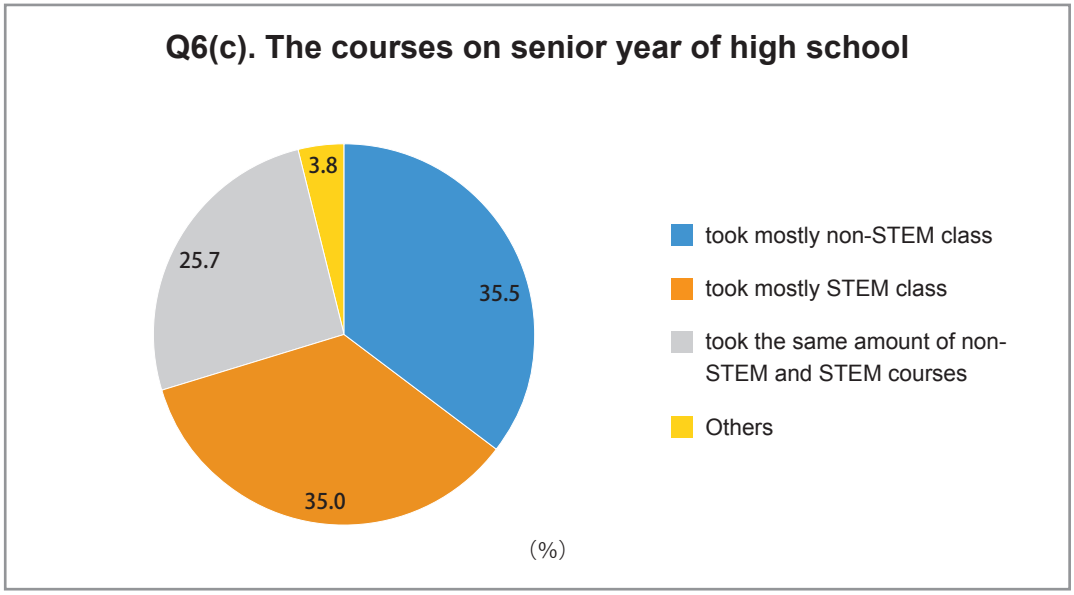
The highest is “prefectural or city public” which occupies about 80%, followed by “private” and “national public”.

2-2. Type of your high school



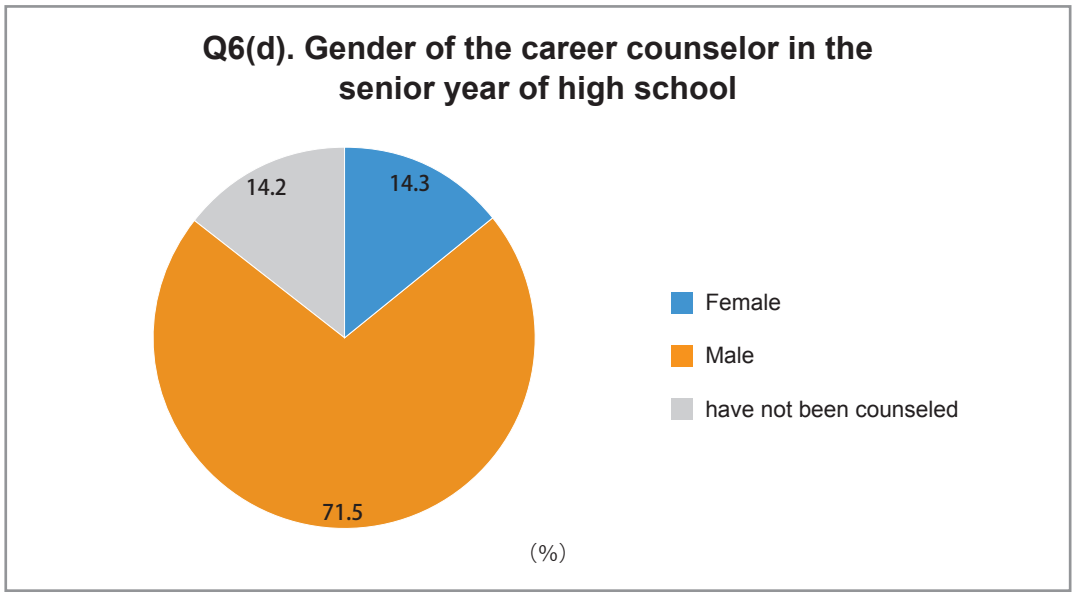
“Co-ed” is three times as much as “all-girls”.

2-3. The courses on senior year of high school



The number of people who chose “took mostly non-STEM class” and “took mostly STEM class” were about the same.

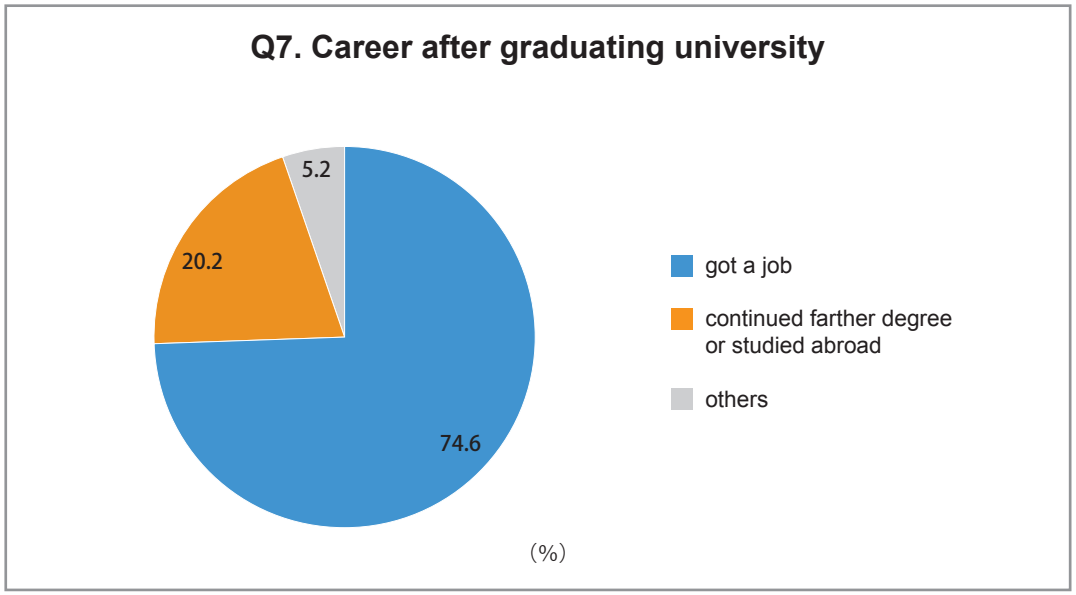
2-4. Gender of the career counselor in the senior year of high school



Male academic and career counselor was the most dominant and it was more than 70%.

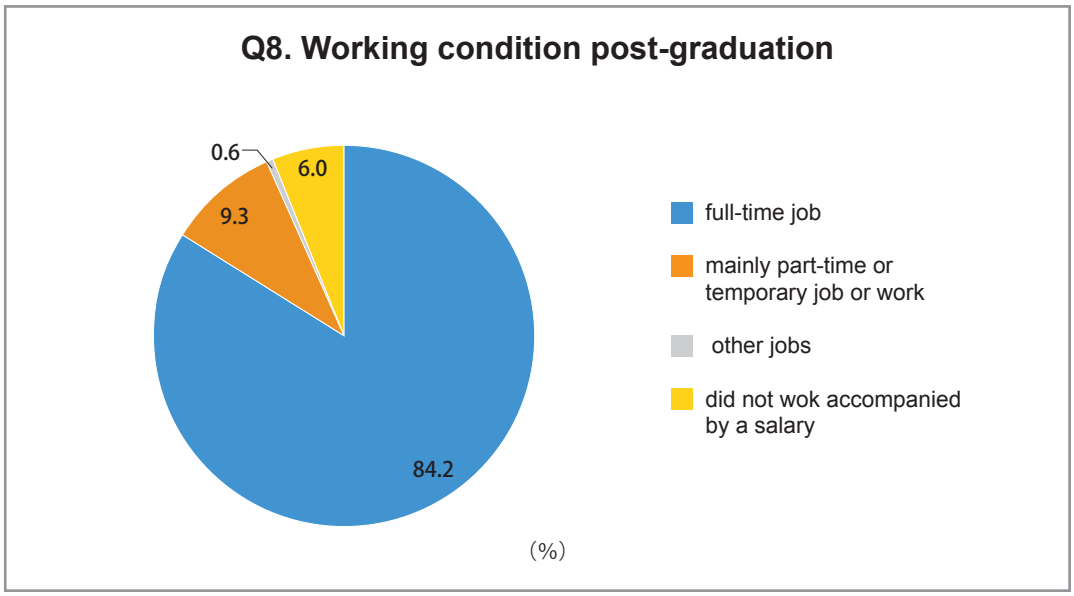
3. Carrier and marriage

3-1. Career after graduating university



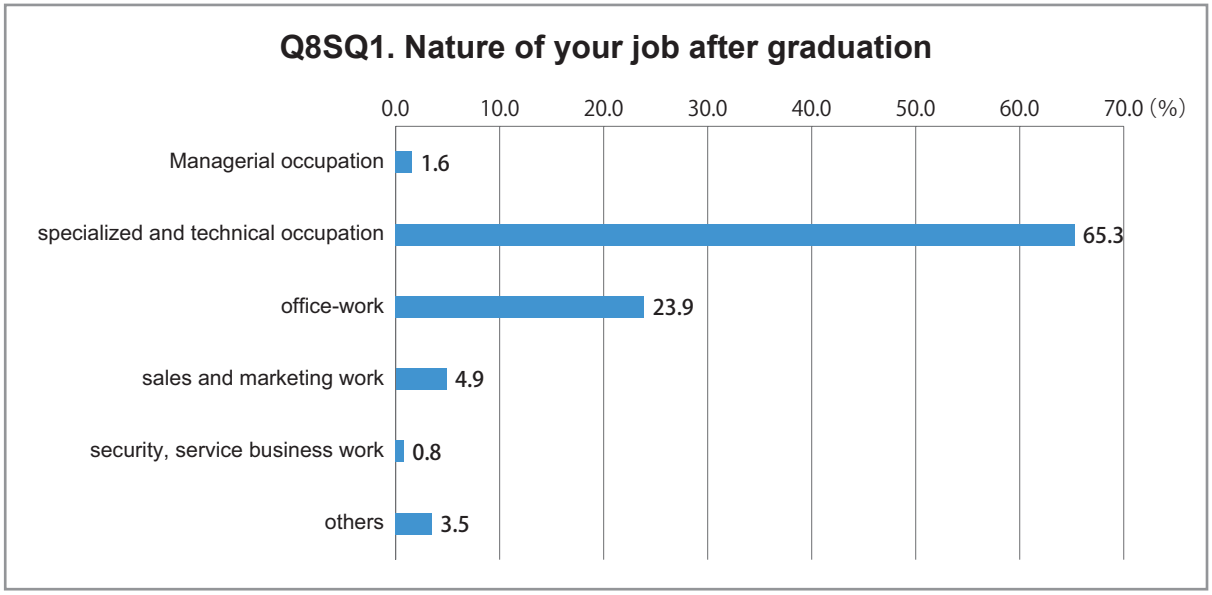
After graduating university, most people got a job and one fifth continued farther degree or studied abroad.

3-2. Working condition post-graduation



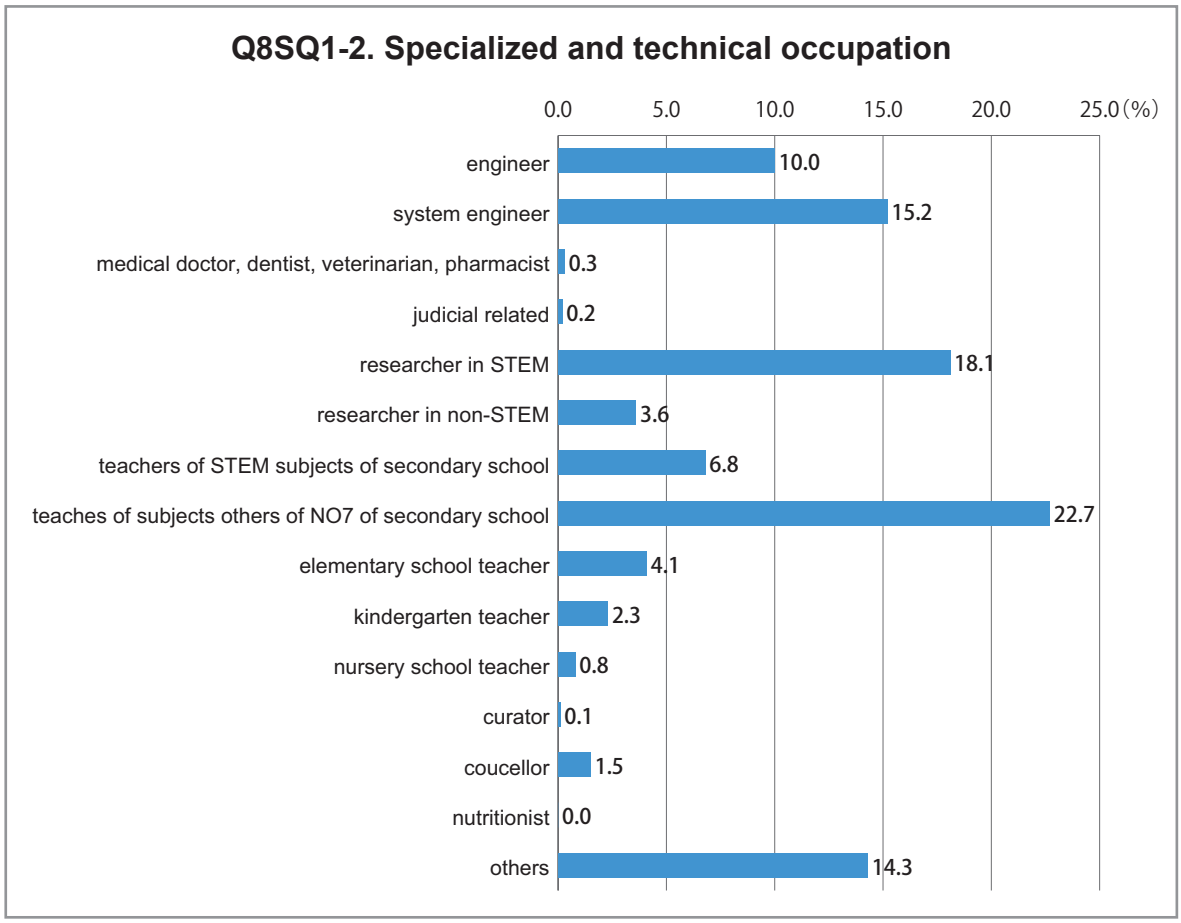
After graduation, 84.2% worked full time.

3-3. Nature of your job after graduation



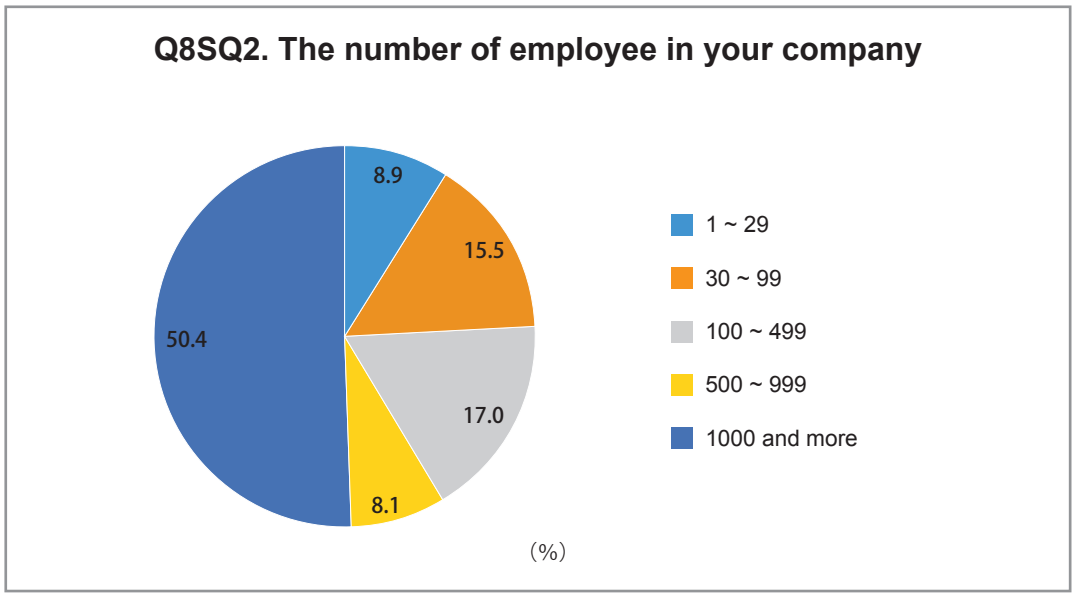
For the nature of your job after graduation, the most was specialized and technical occupation with 65.3%, the next was office-work.

3-4. Specialized and technical occupation



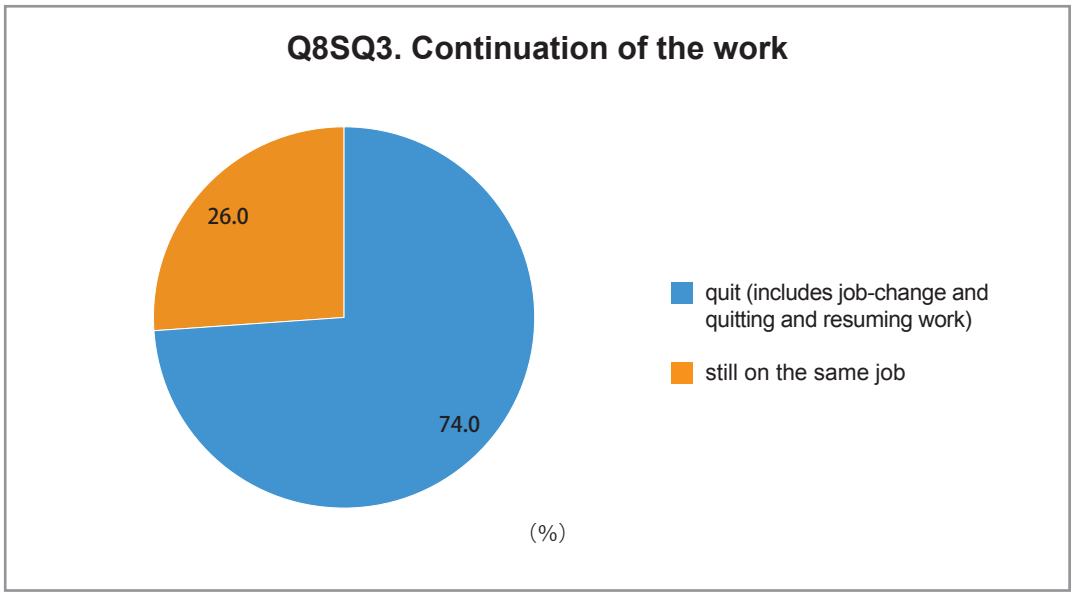
Teachers of non-STEM subjects of secondary school out of specialized and technical occupation (1187 people) were the highest with 22.7% and when this is added with teachers of STEM subjects of secondary school 6.8%) about 30% were secondary school teachers. Researchers in STEM were 18.1%, and when this is added with researchers in non-STEM (3.6%), more than 20% were researchers. System engineers were 15.2% and engineers 10.0%, both percentages reaching two digits.

3-5. The number of employee in your company



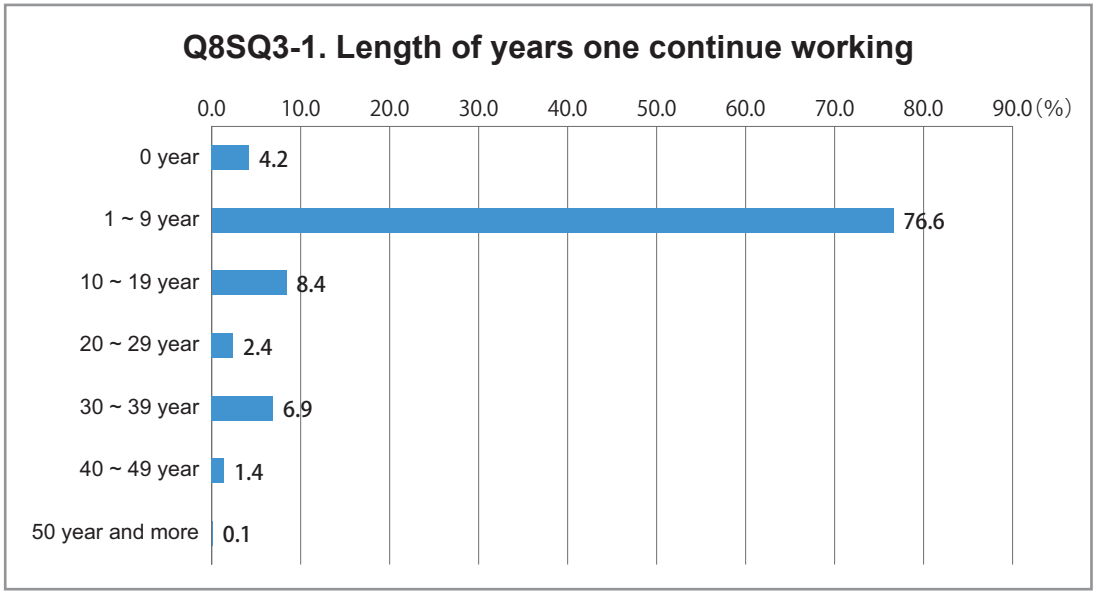
More than half worked for companies with 1000or more employees.

3-6. Continuation of the work



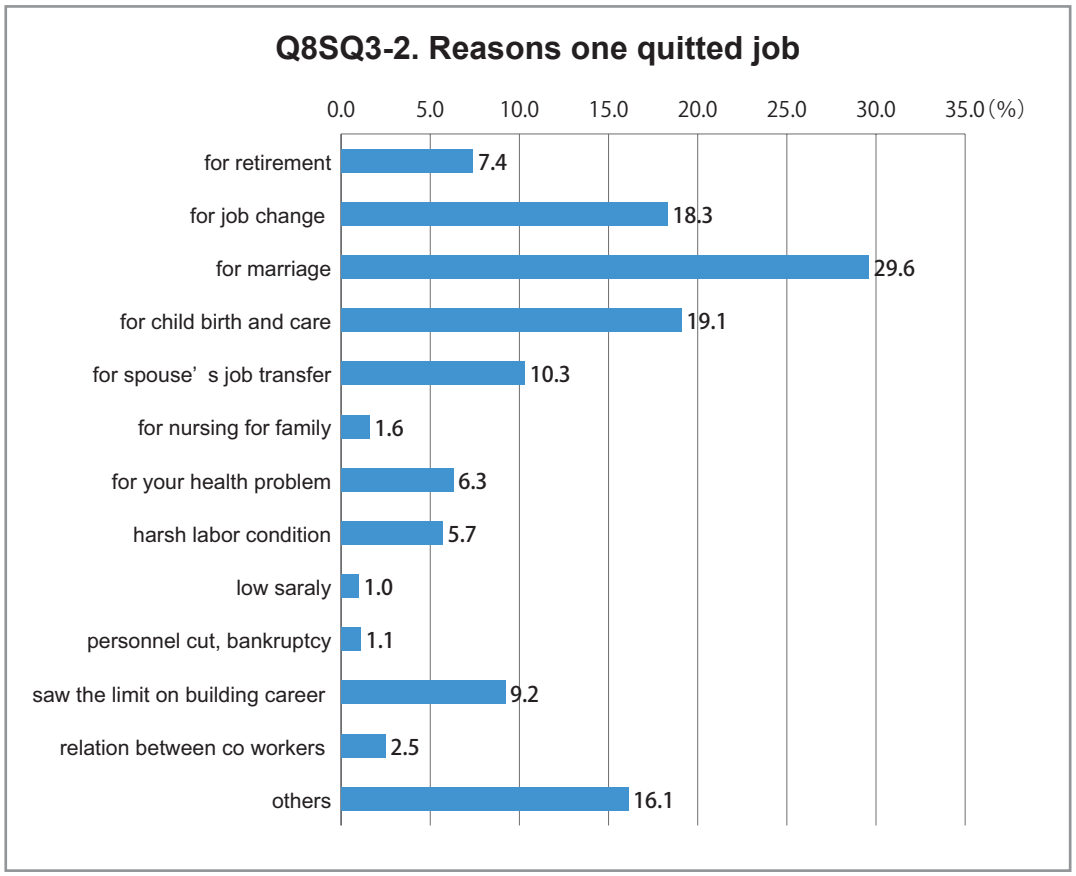
Three forth of the quit, which included job-change and quitting and resuming work, were quitting their first job after graduation.

3-7. Length of years one continue working



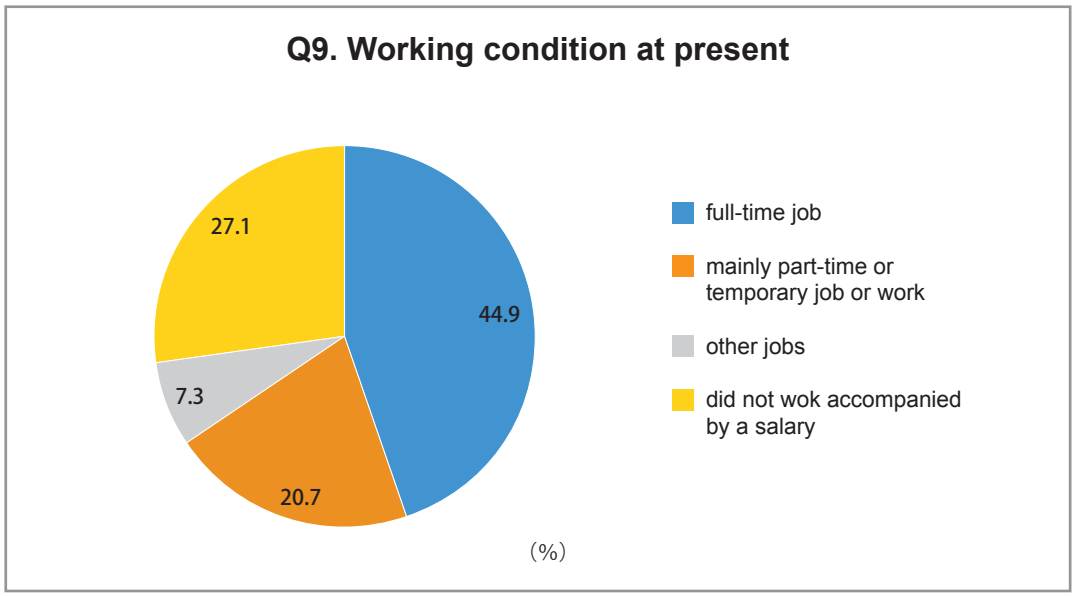
More than three forth quitted first job within 1 to 9years. 80% continued working less than 10 years (4.2%+76.6%).

3-8. Reasons one quitted job



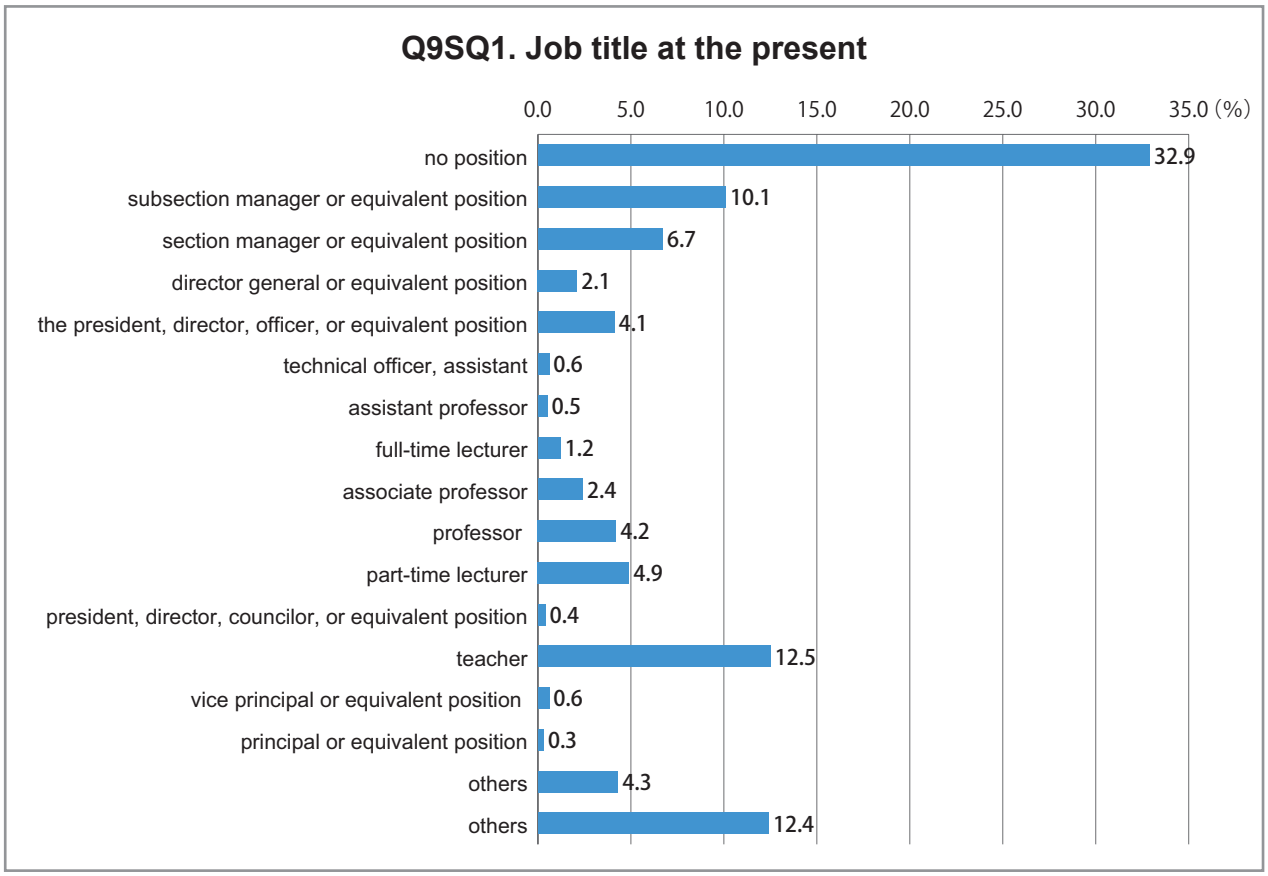
The most popular reason for quitting the job was marriage ,30% followed by "for child birth and care (19.1%)" and "for job change (18.3%)". This matches the typically called "curve M" ****

3-9. Working condition at present



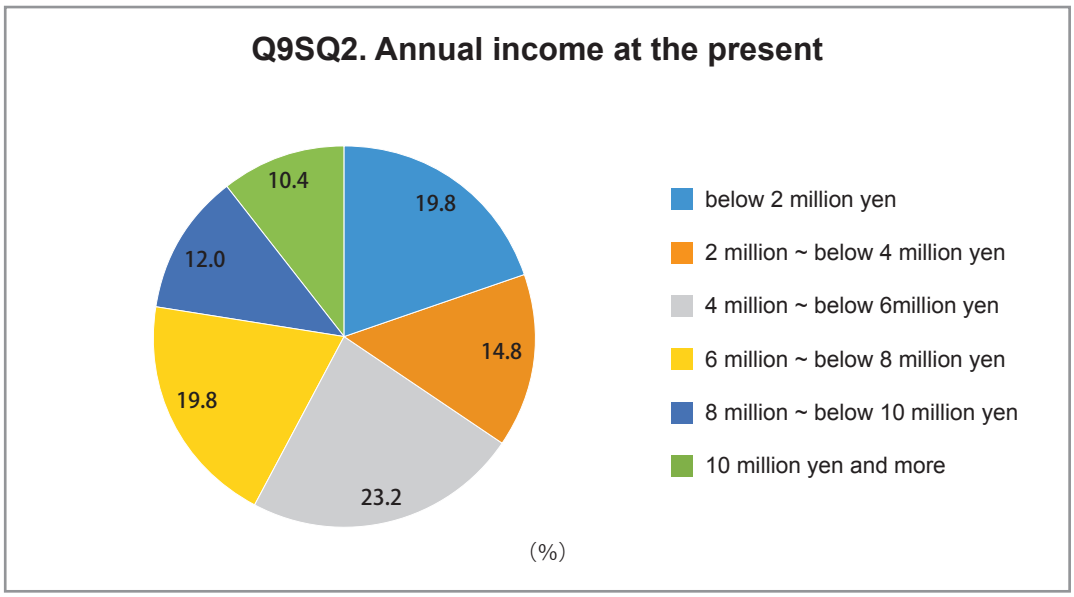
Compare to the fact that 84.2% worked full-time after completing bachelor or master degree, at the present, the number decreased to 44.9%. Also those who worked without proper salary increased to , 27.1% from 6%. "Mainly part-time or temporary job or work" increased 20.7% from 9.3%. A present employment rate decreased compare to the number after completing bachelor or master degree.

3-10. Job title at the present



No title was the most with 32.9%, followed by “teacher (12.5%)”, and “others”.

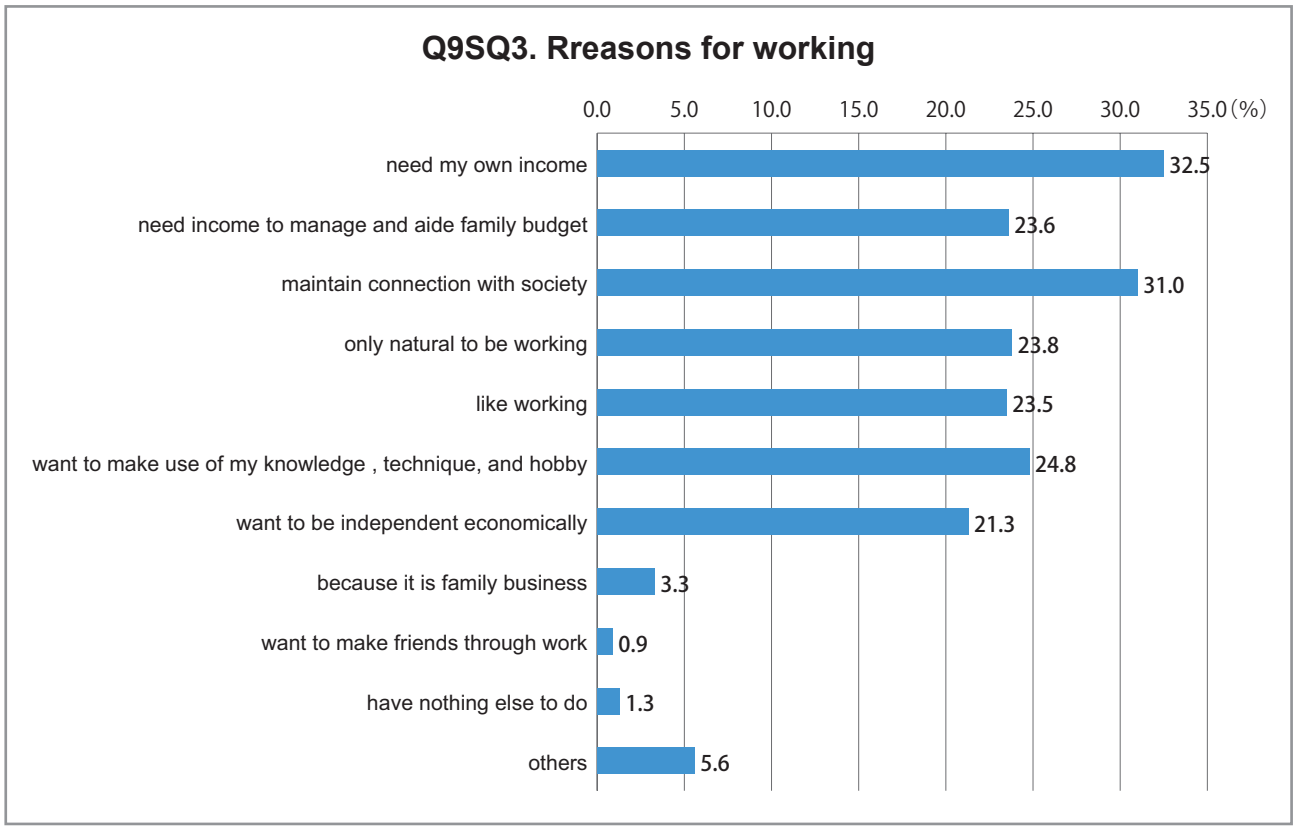
3-11. Annual income at the present



“4 million ~ below 6 million yen (23.2%)” was the most at the present, followed by both “below 2 million yen (19.8%)” and “6 million ~ below 8 million yen (19.8%)”

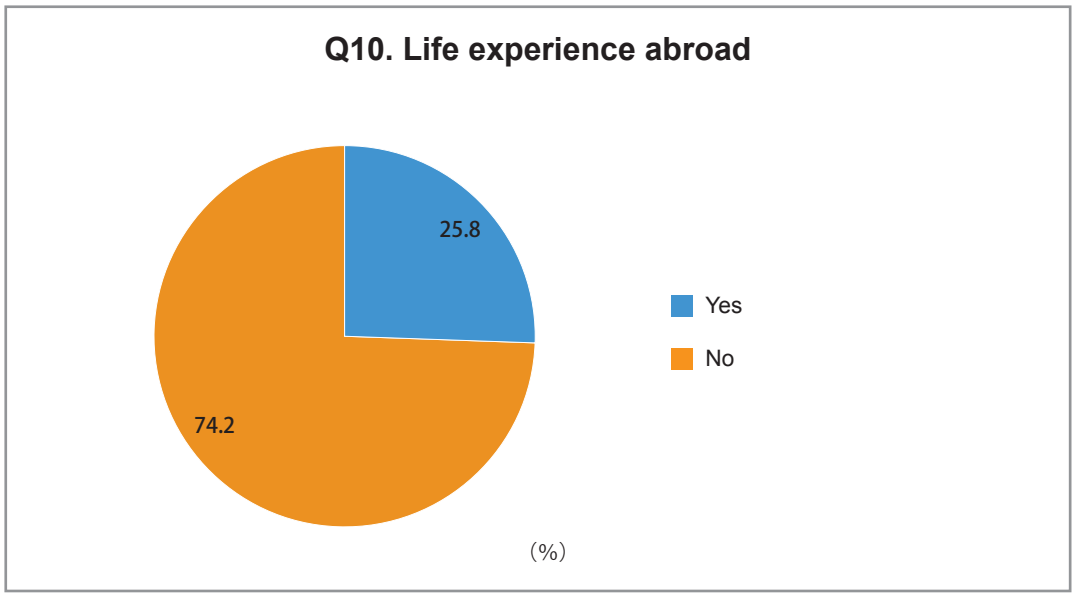
Compare to those who worked without proper salary (27.1%), there is less percentage of people who earn “below 2 million yen (19.8%)”, so assumptions can be made that they have some sort of income from real estates or interest.

3-12.Reasons for working



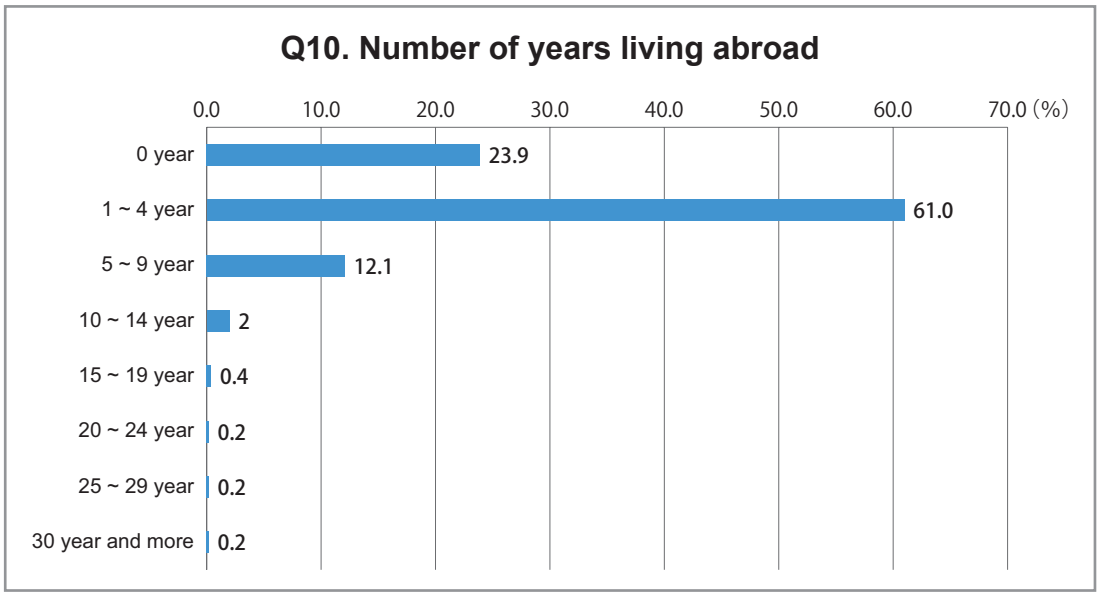
Most popular reason was “need my own income” with 32.5% followed by “maintain connection with society” with 31.0%. ” need income to manage and aid family budget”, “only natural to be working”,
“like working” and “want to make use of my knowledge, technique, and hobby” were about the same.

3-13. Life experience abroad



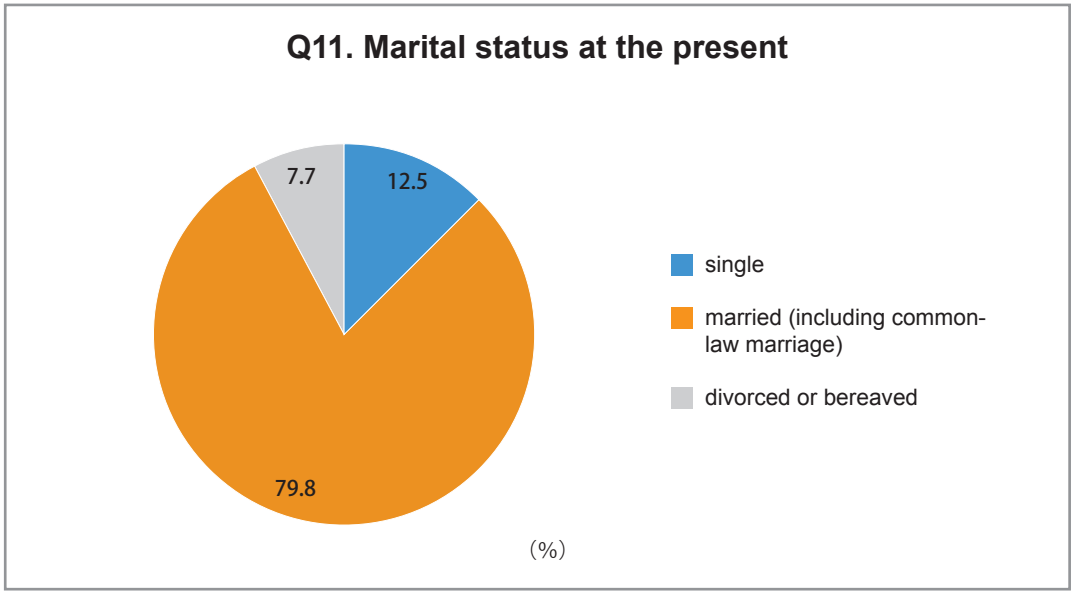
People who had life experience abroad were 25.8% and more people did not have experience.

3-14. Number of years living abroad



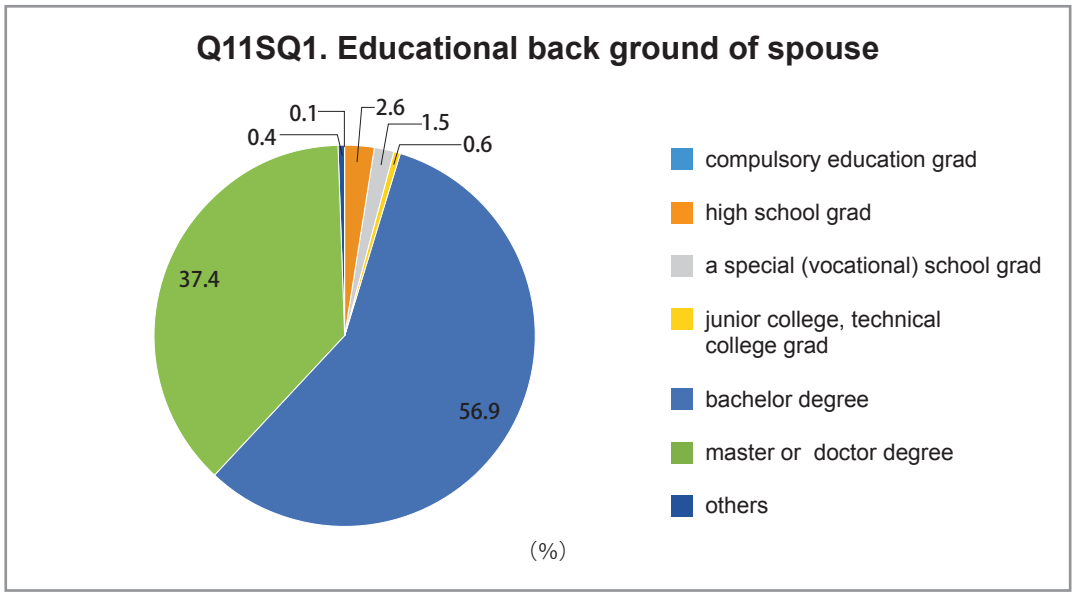
97% of the people lived less than 10 years. The most popular was 1 ~ 4years with 61.0%.

3-15. Marital status at the present



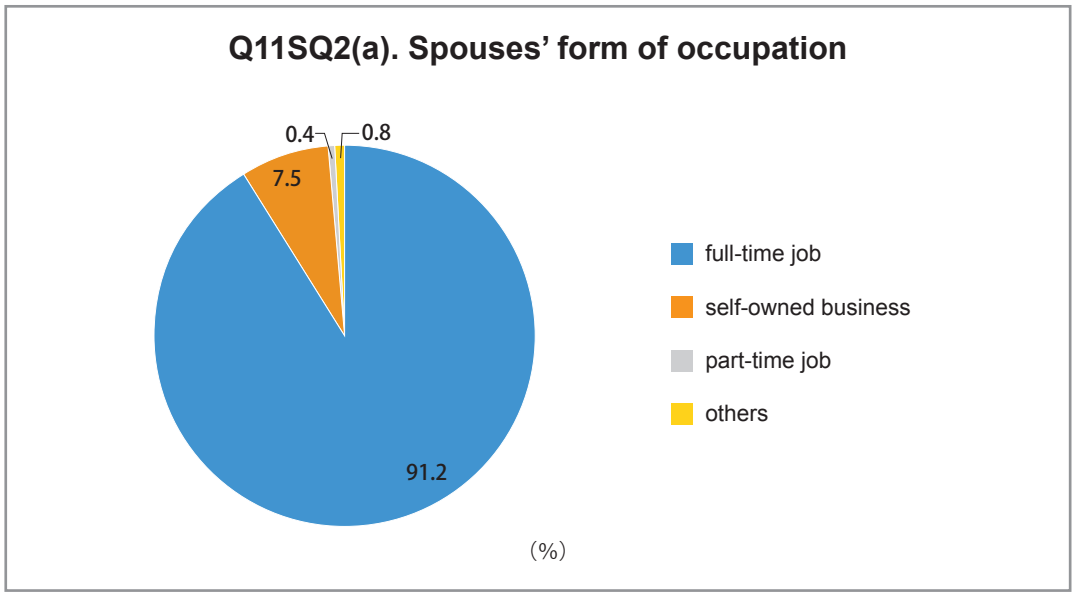
People who are married at the present were the highest and occupied approximately 80%. Single was 12.5%.

3-16. Educational back ground of spouse



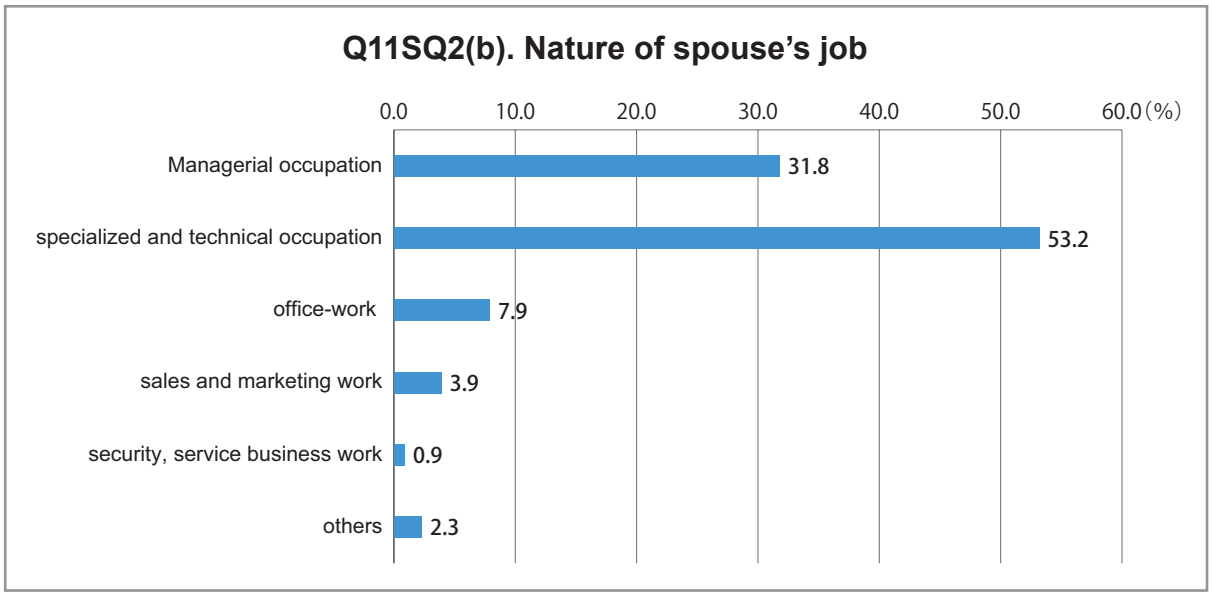
The most was bachelor with 56.9%, followed by "master or doctor degree (37.4%)". "Bachelor" and "master or doctor degree" together occupied 84.3%. Compared to the fact the graduates consisted of bachelor (74.2%) master (17.9%),doctor (7.9%), the percentage of master and doctor degree of spouse exceeded the graduates by 11.6%.

3-17. Spouses' form of occupation



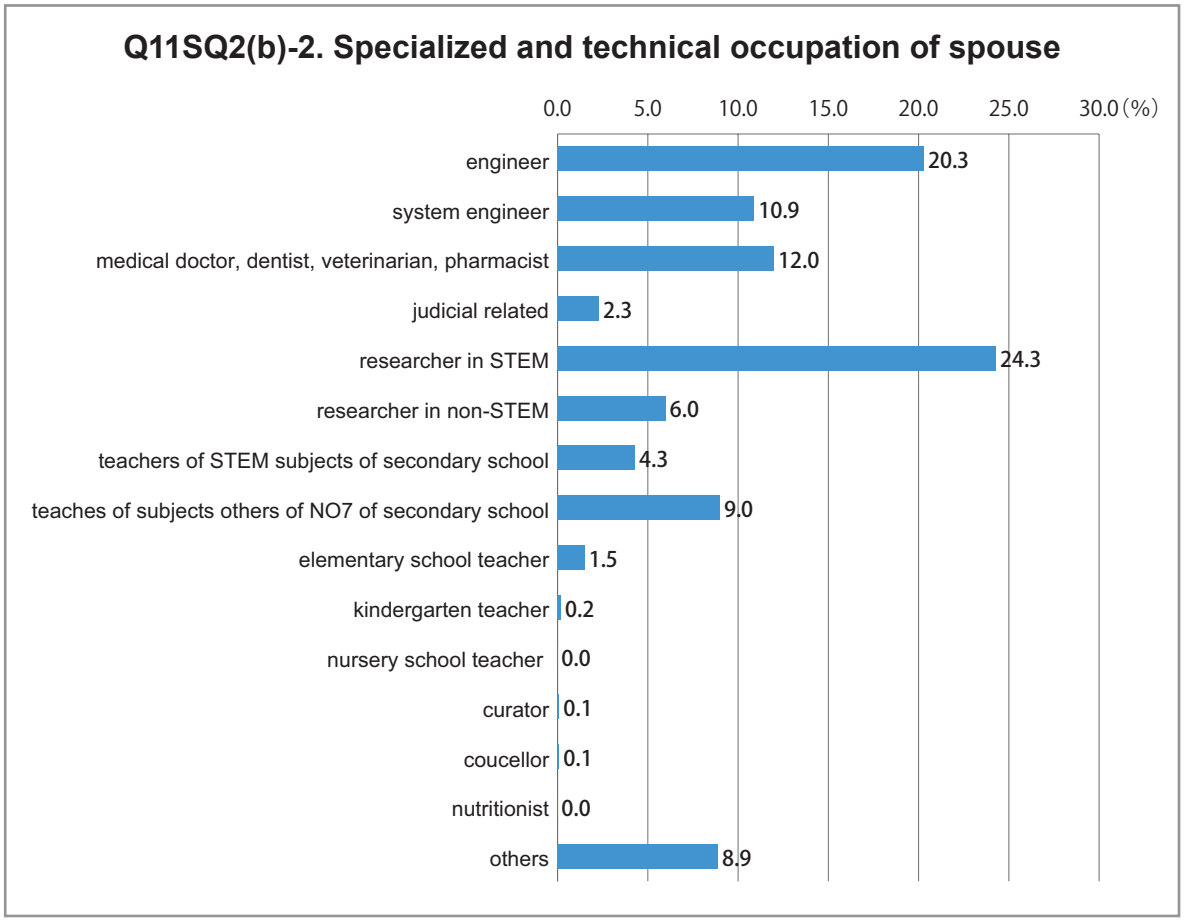
Full time occupied 91.2% and self-owned business was 7.5%. Among the graduates, 44.9% worked full time whereas twice that number of spouses work full time. Also, the percentage of spouses working fulltime was higher than the percentage of graduates worked full time after graduating university or graduate school (84.2%).

3-18. Nature of spouse's job



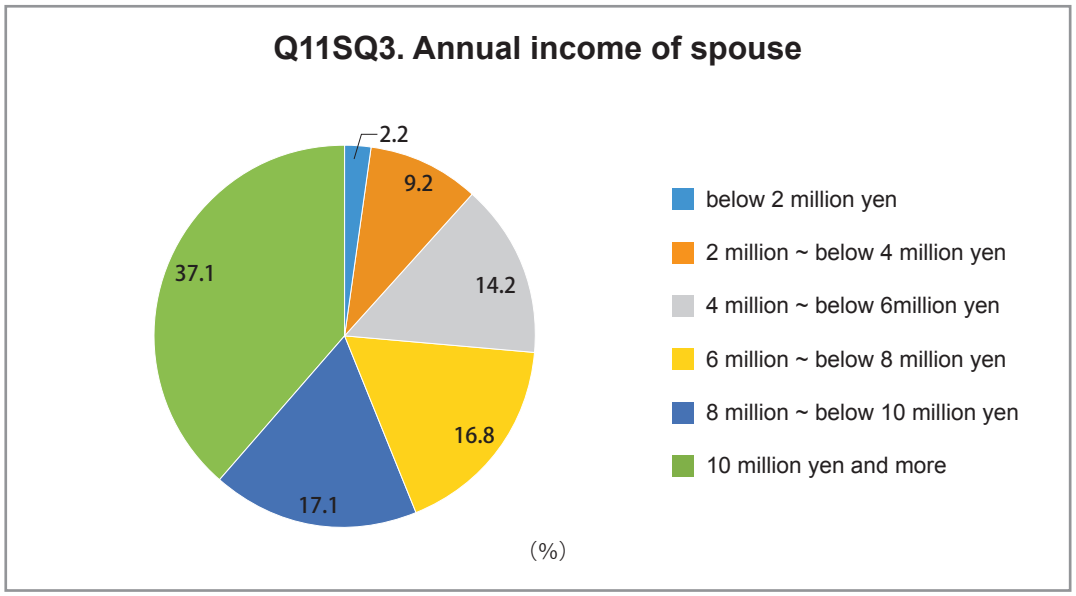
The most was "specialized and technical occupation" with 53.2%, followed by managerial occupation with 31.8%. These two occupied 85%.

3-19. Specialized and technical occupation of spouse



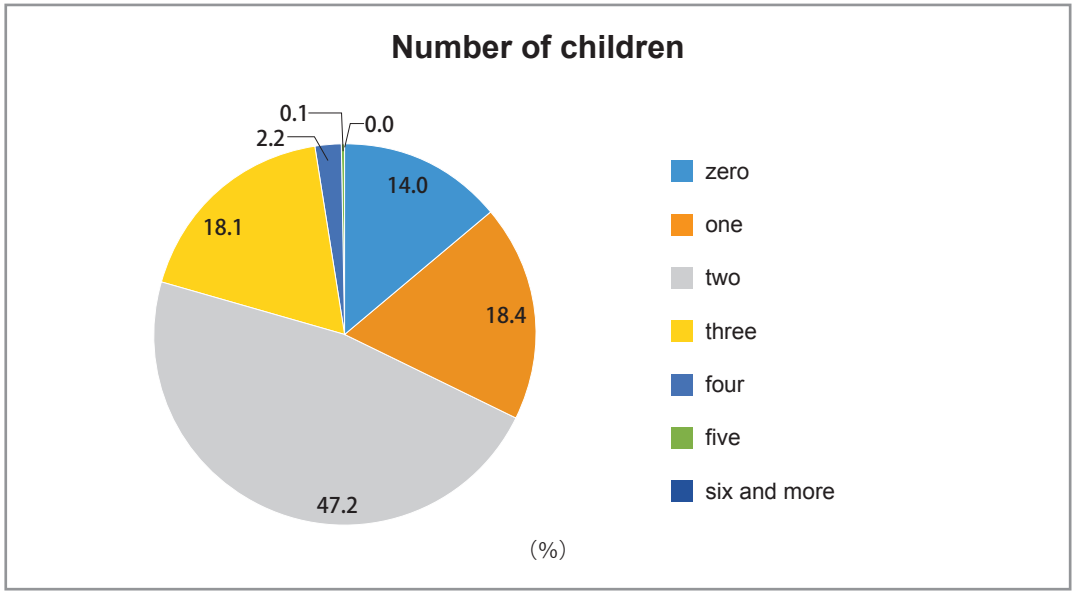
Among special and technical occupation (908 people), "researcher in STEM" was the highest with 24.3% and when this is added with "researcher in non-STEM", about 30% were researchers. "Engineer " was the second highest with 20.3%, and total percentage of STEM related occupation including "medical doctor, dentist, veterinarian, pharmacist" with 12.0%, " system engineer" with 10.9% and teachers of STEM subjects of secondary school with 4.3% summed up to 71.7%.

3-20. Annual income of spouse



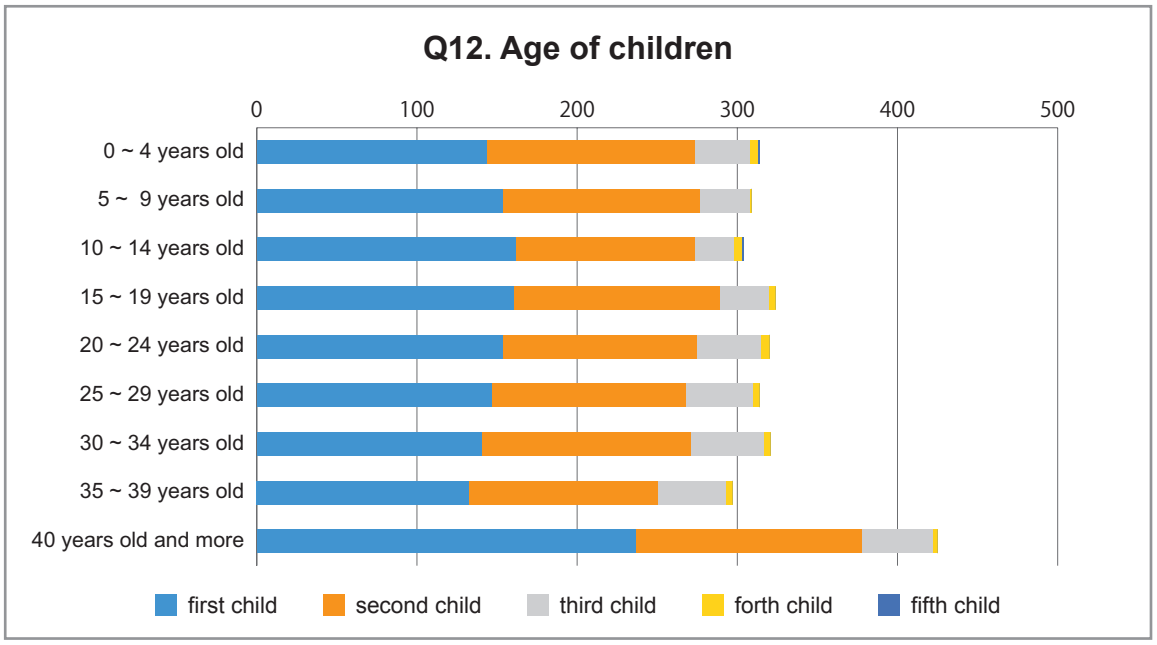
"10 million yen and more" was the highest with 37.1%, followed by" 8 million ~ below 10 million yen" with 17.1%.

3-21. Number of children

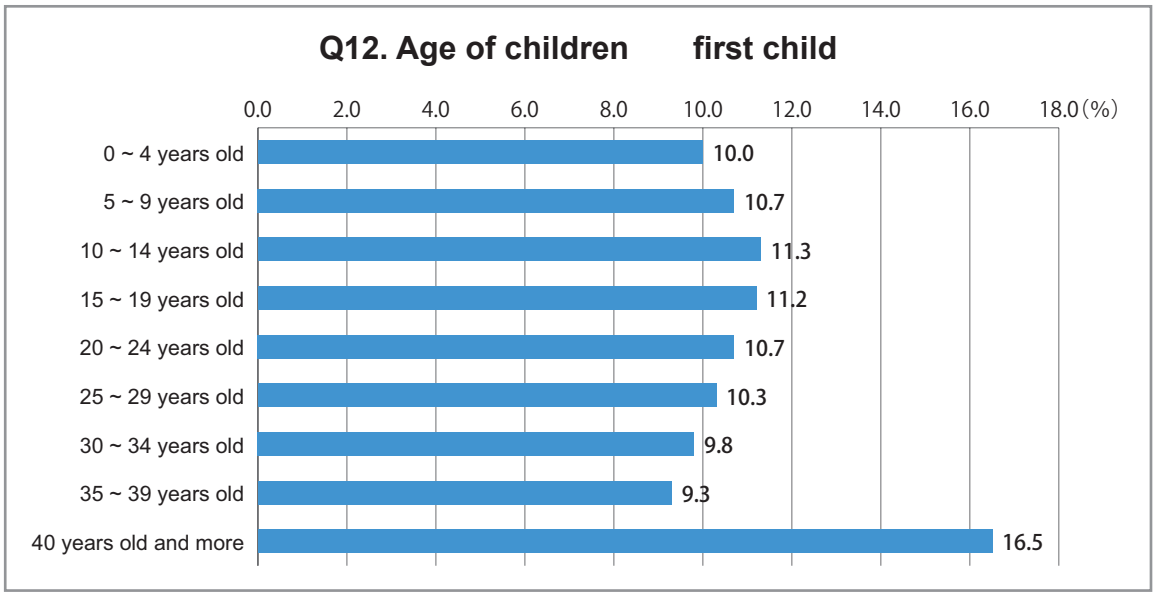


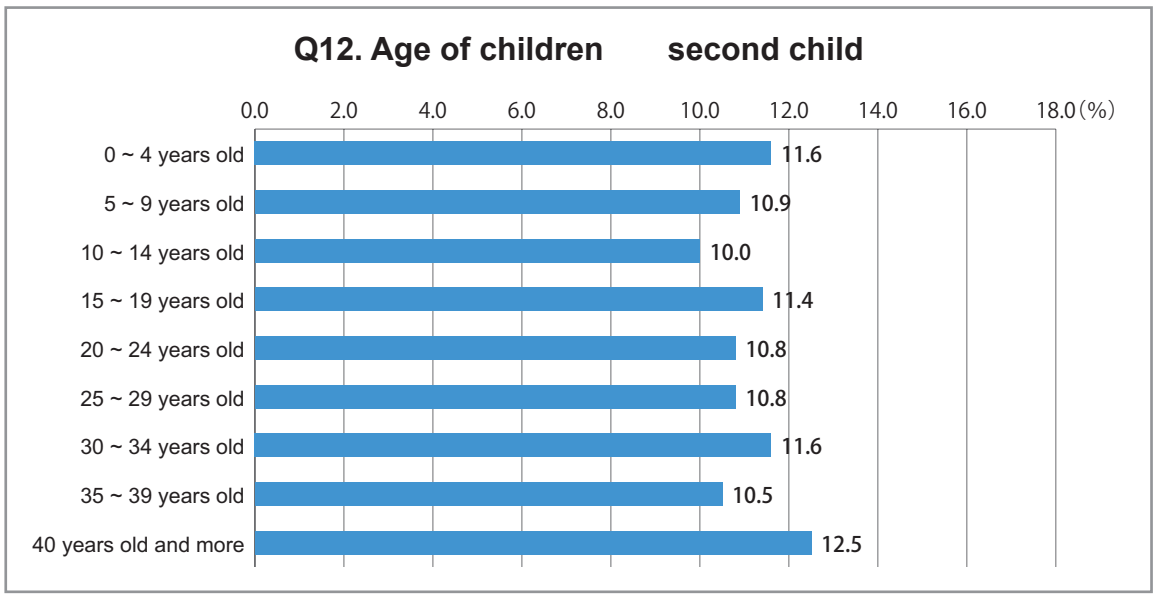
People with two children occupied the most with 47.2%, followed by one child with 18.4%, followed by three children with 18.1%. 14.0% of married people had no children. 34 People with 4 children and this was only 2.2% as a whole. Two people have 5 children and this was 0.1%. No one had 6 children.

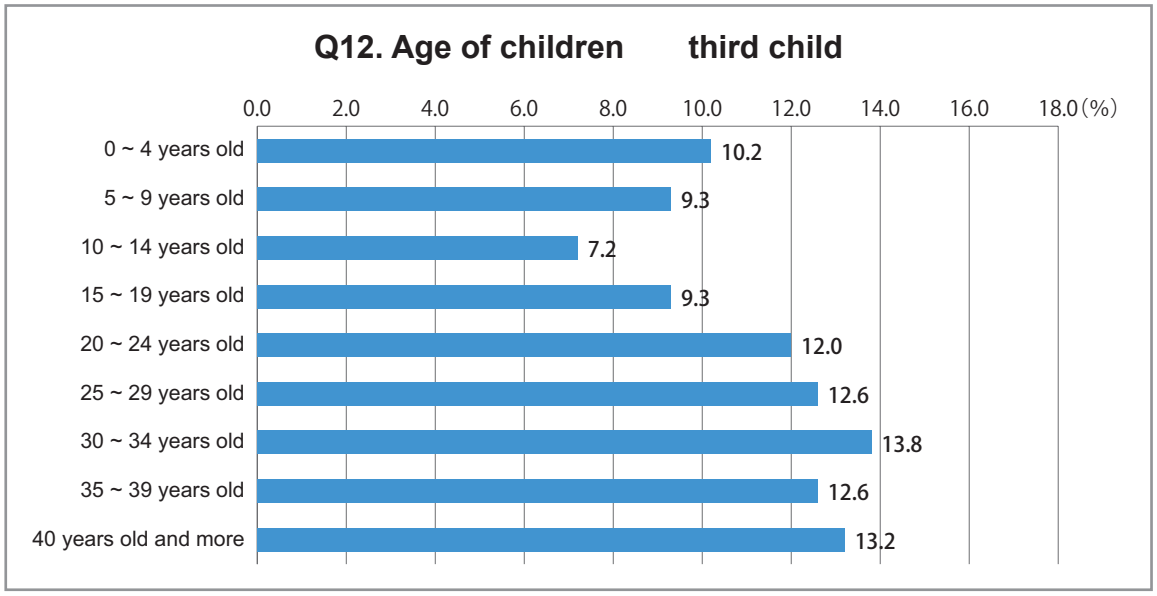
3-22. Age of children

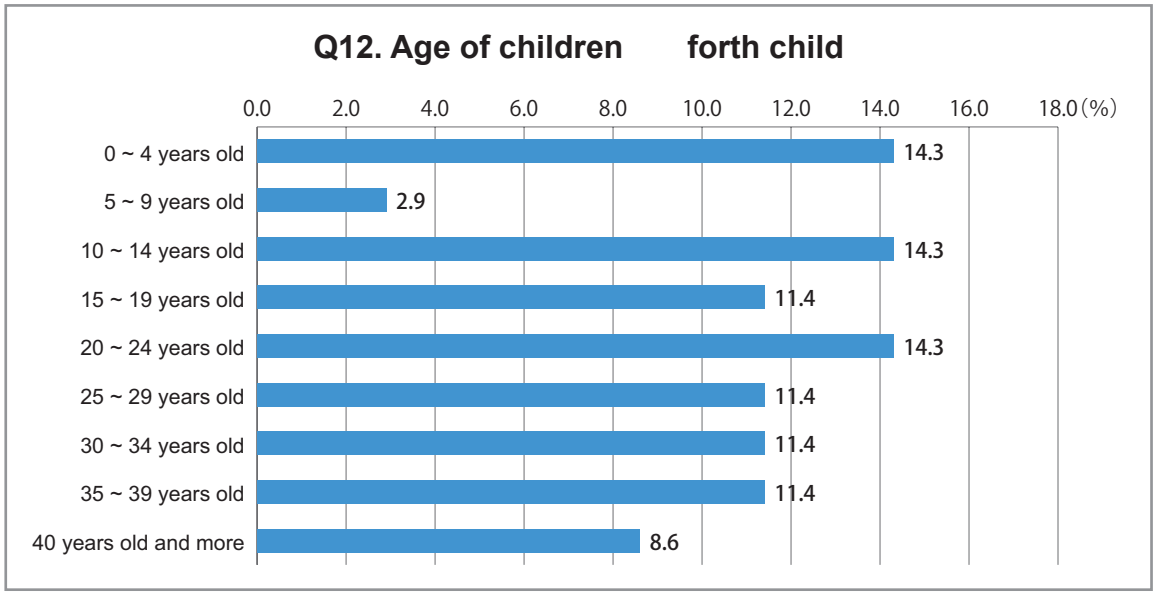


"40 years old and more" was the highest with 14% and the other age group were in equilibrium, occupying nearly 10% each.



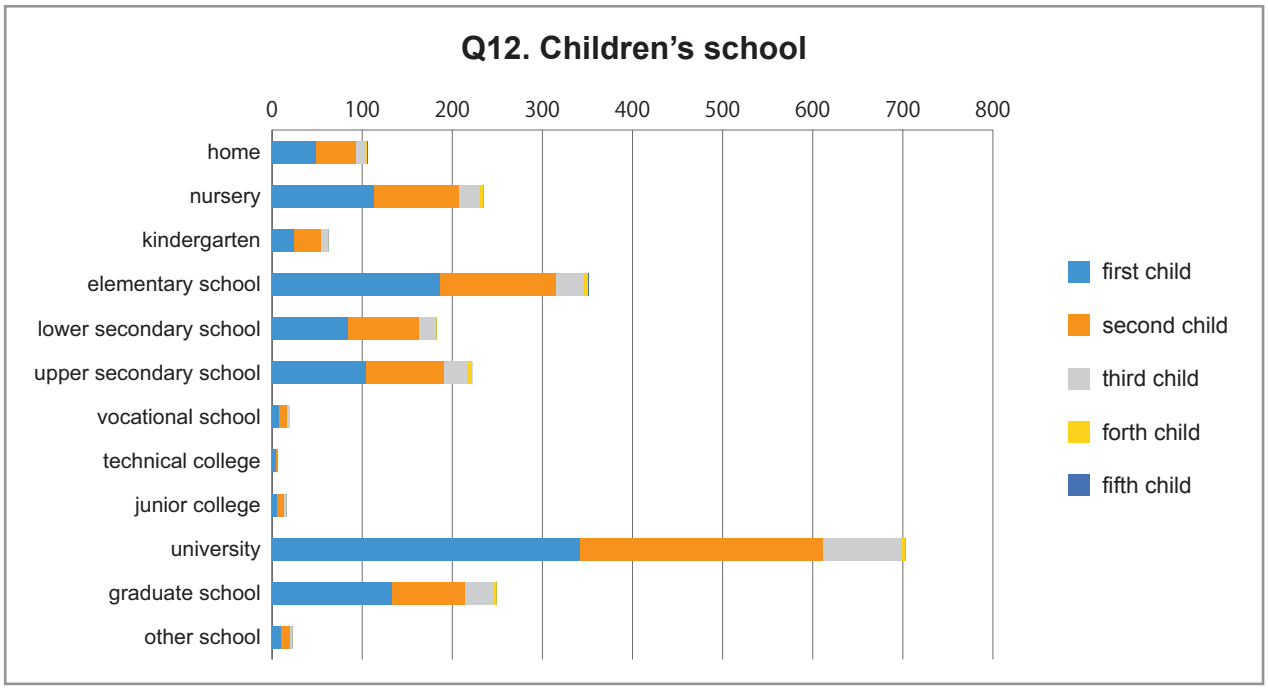






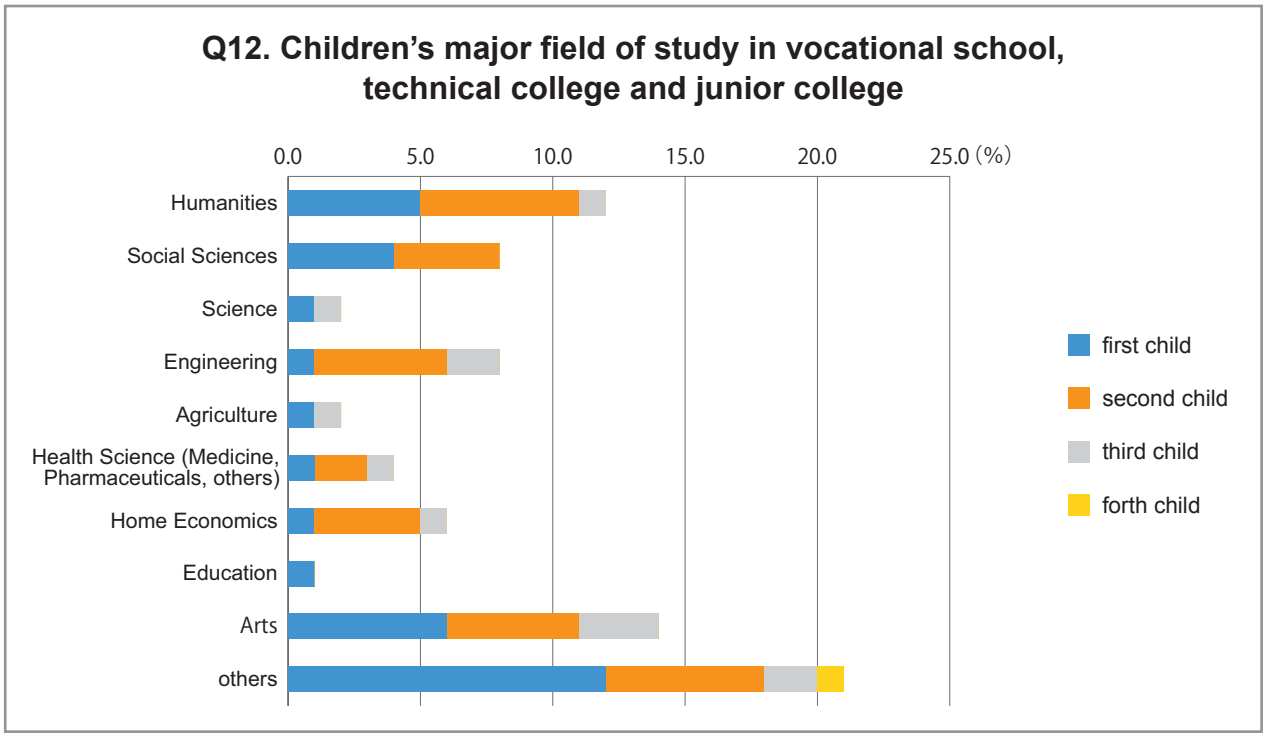
the group of over 40 years old occupied the most for the first child and the second child, they were 16.5%, 12.5%. For the third child, age group 30 ~ 34 was the most with 13.8%. 37 people out of 1477 said they had 4th child, that was 2.5%. Two people had the fifth child.

3-23. Children's school



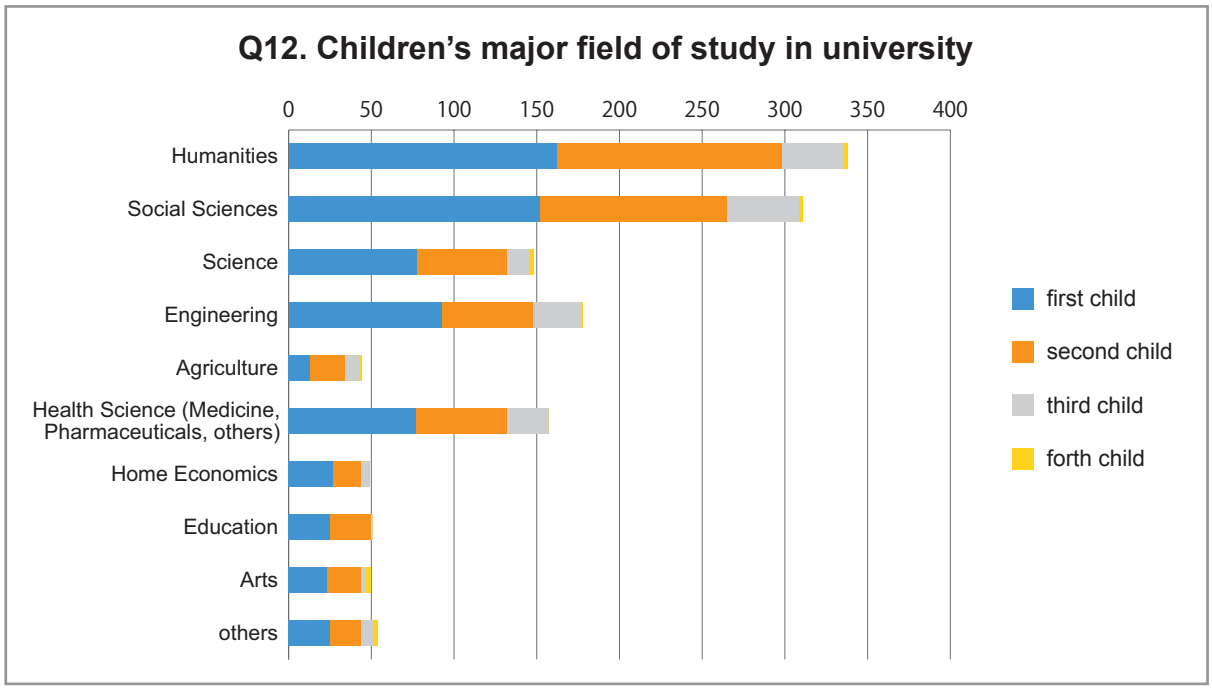
Most answered "college student" that was 32.3%, followed by graduate school with 11.4%.

3-24. Children's major field of study in vocational school, technical college and junior college



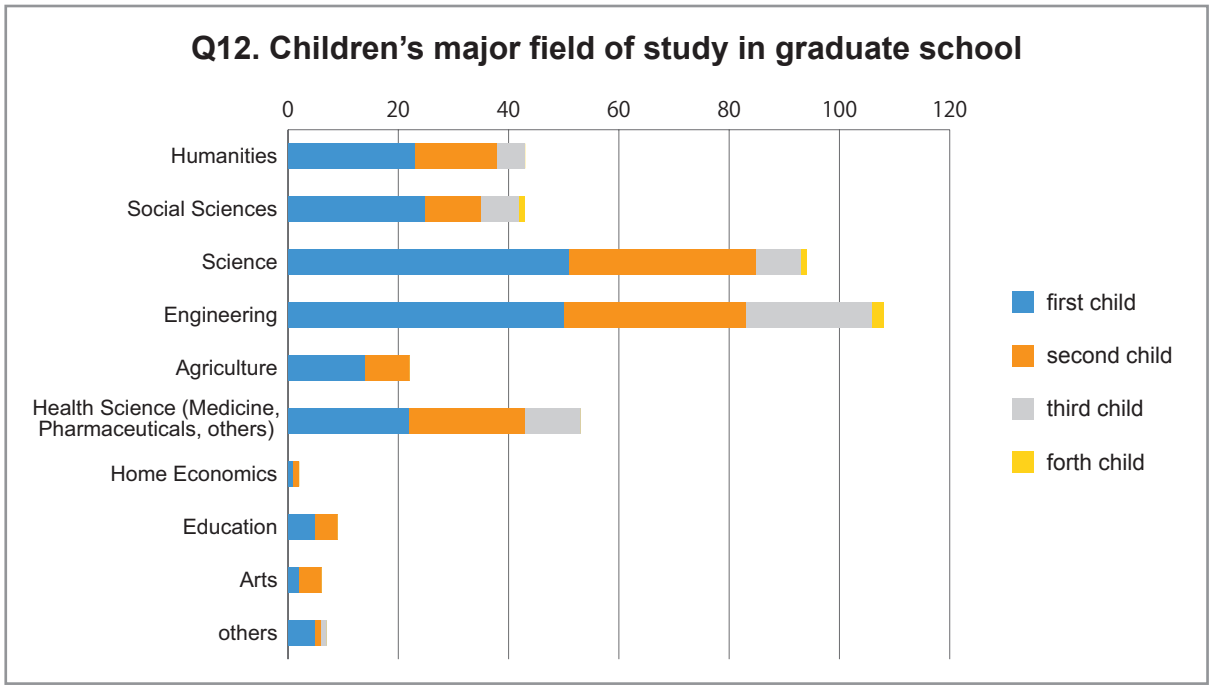
In terms of children's major field of study in vocational school, technical college and junior college, "others" was the highest followed by "arts" and "humanities".

3-25. Children's major field of study in university



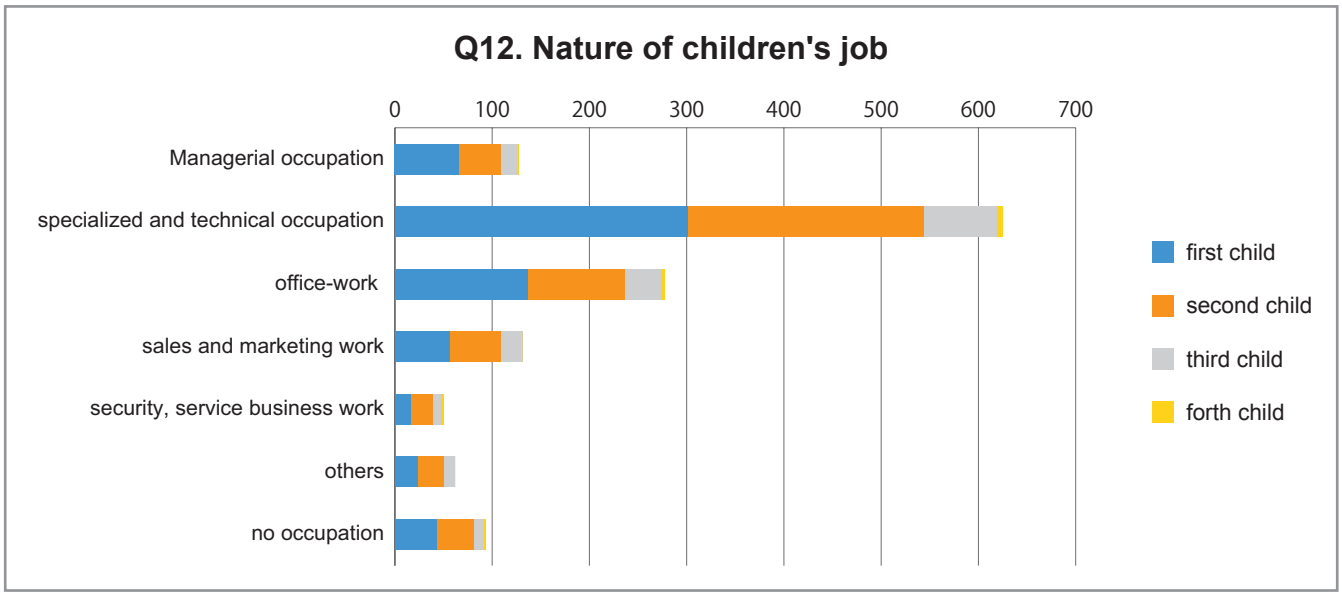
"Humanities" was the highest with 24.5%, followed by 22.5%. In the field of STEM, "engineering" was the highest with 12.9%.

3-26. Children's major field of study in graduate school



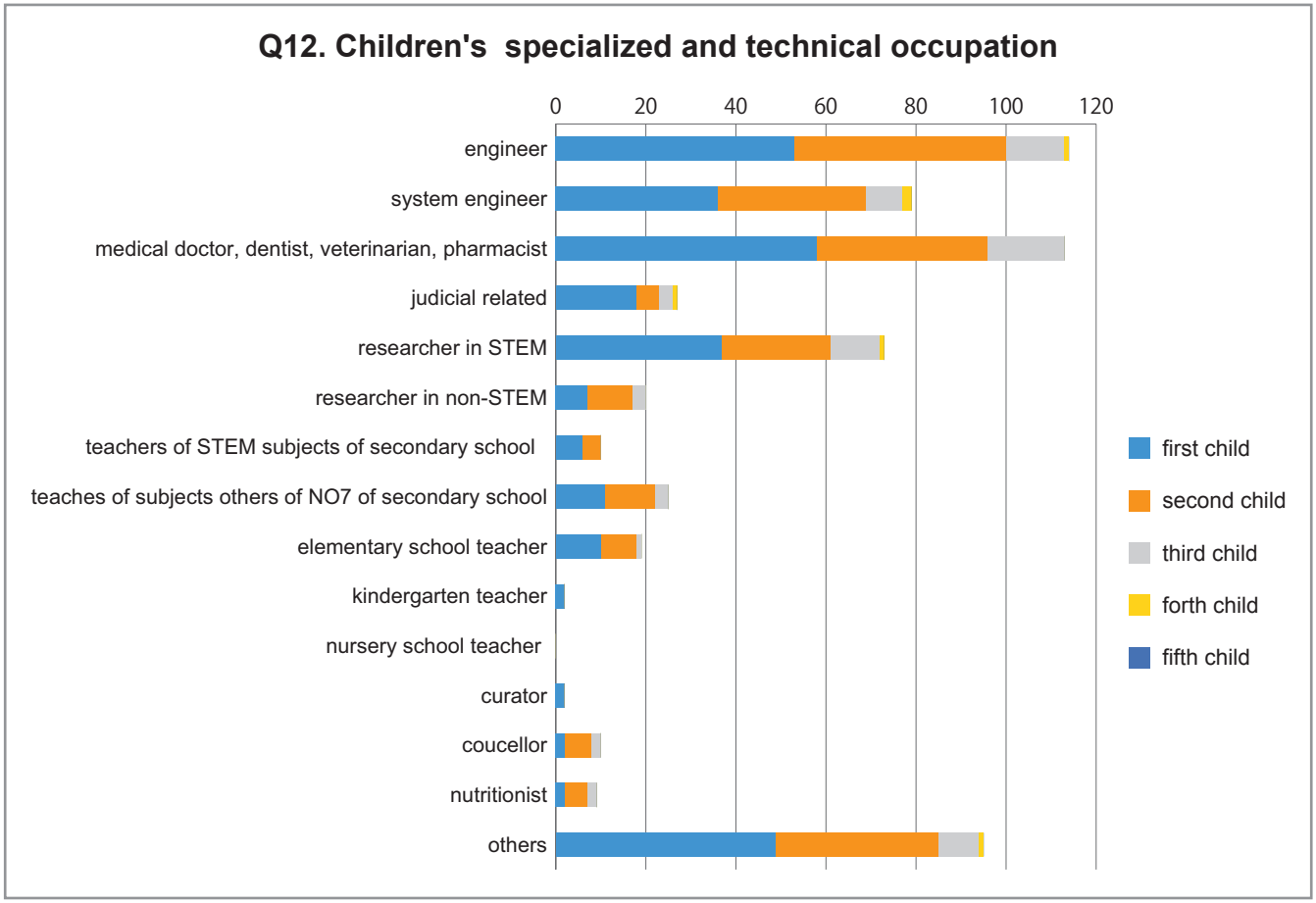
The most was engineering with 27.9%, followed by "science" with 24.3%. Compare to university, there were more people who majored STEM field.

3-27. Nature of children's job



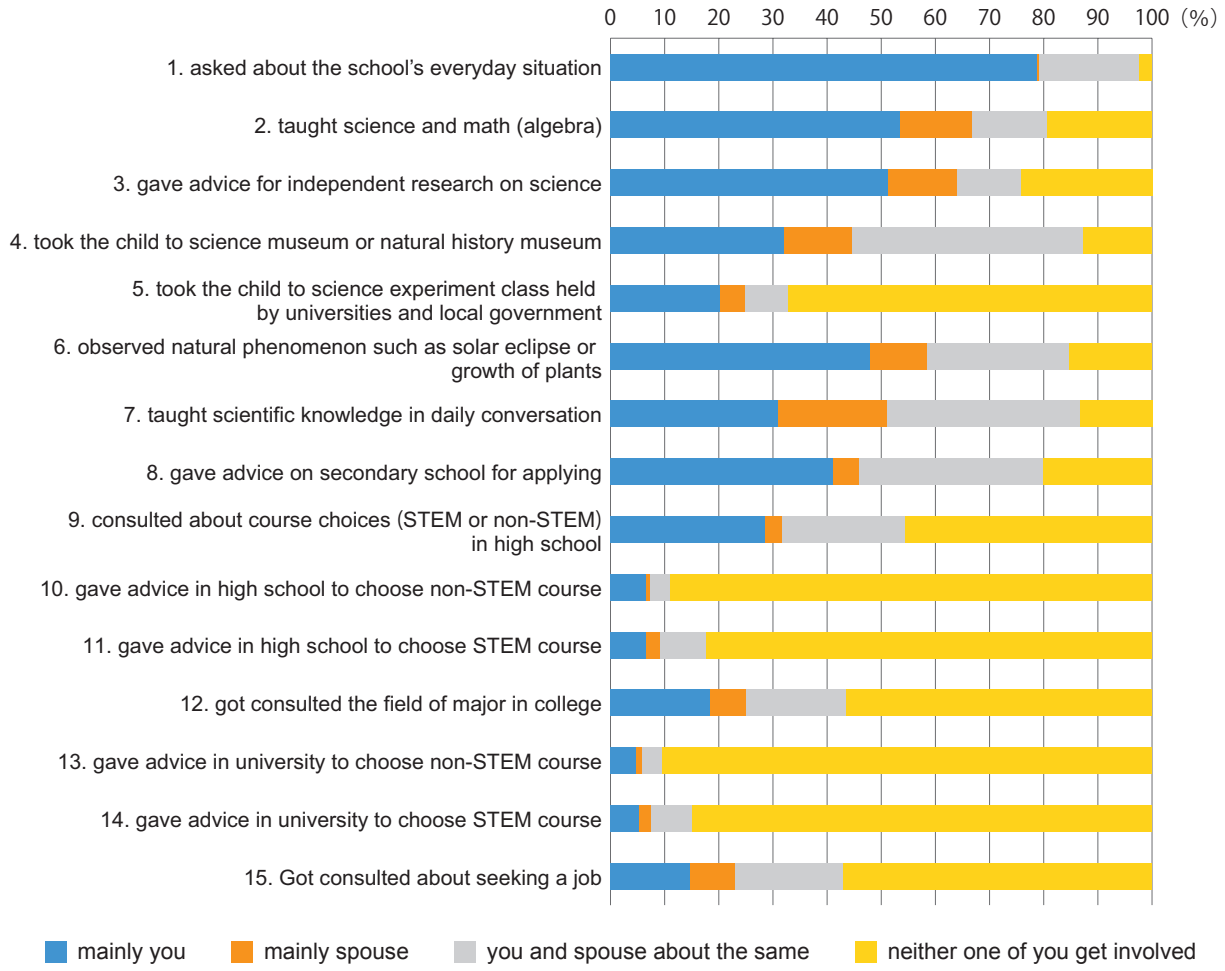
"Specialized and technical occupation" occupied most with 45.7%.

3-28. Children's specialized and technical occupation



The highest was the "engineer" with 19.1% followed by "medical doctor, dentist, veterinarian, pharmacist", with 18.9%. The Kind of occupation regarded as STEM occupied 64.9%.

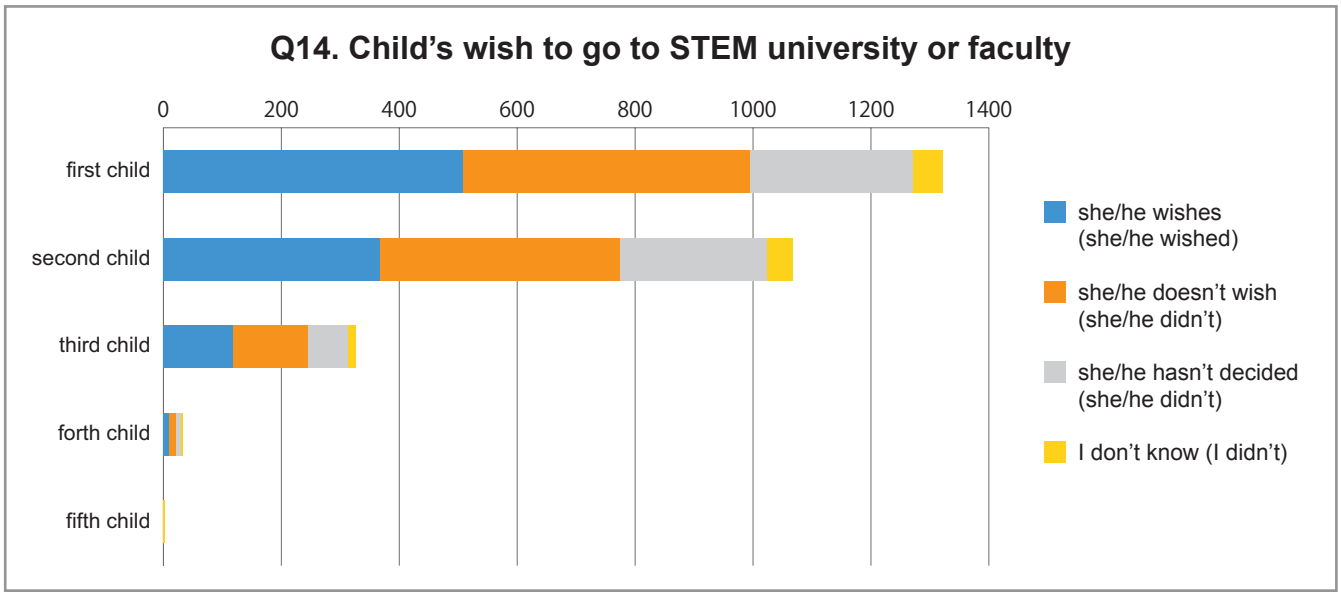
3-29. Parents' involvement in child's education



In involvement of parents concerning the child's education and path, in every item, the mothers (graduates) ' involvement outnumbered that those that they were relatively involved were of the father. Although the fathers' involvement was not much, out of those that they were relatively involved were "taught scientific knowledge in daily conversation" with 20.2%, "taught science and math (algebra)" with 14.2%, "gave advice for independent research on science" with 13.7%, "took the child to science museum or natural history museum" with 12.2% and "observed natural phenomenon such as solar eclipse or growth of plants" with 10.9%.

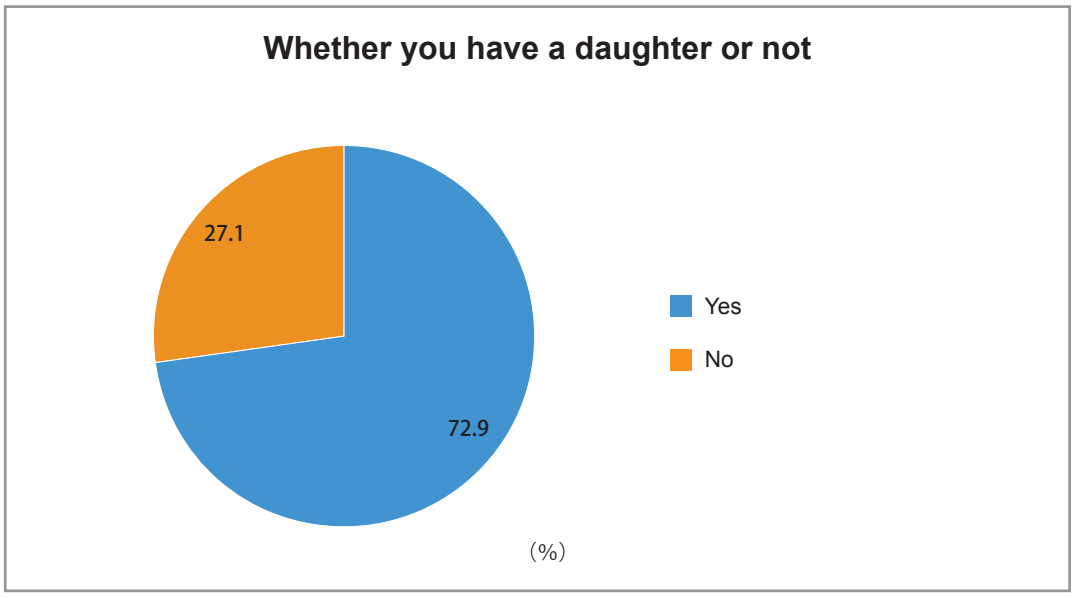
Those are items that are not everyday genereral items but they are items which are related to STEM which reqired specific STEM knowledge.

3-30. Child's wish to go to STEM university or faculty



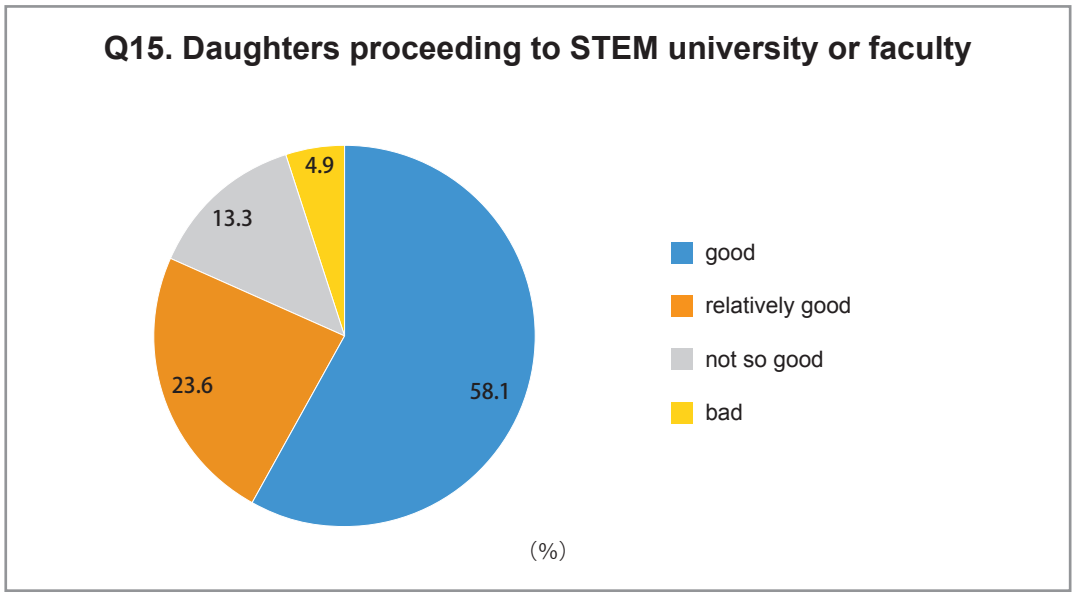
In terms of the child's wish to go to STEM university or faculty, "she/he wishes" and "she/he doesn't wish " occupied one third each and nearly the same.

3-31. Whether you have a daughter or not



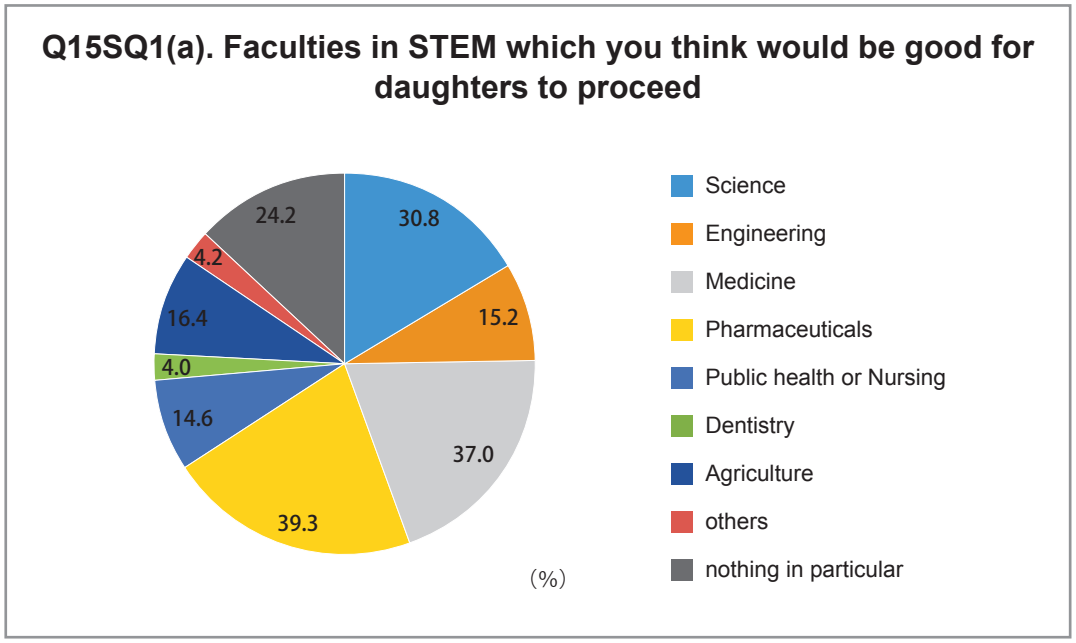
People with daughters were 72.9%.

3-32. Daughters proceeding to STEM university or faculty



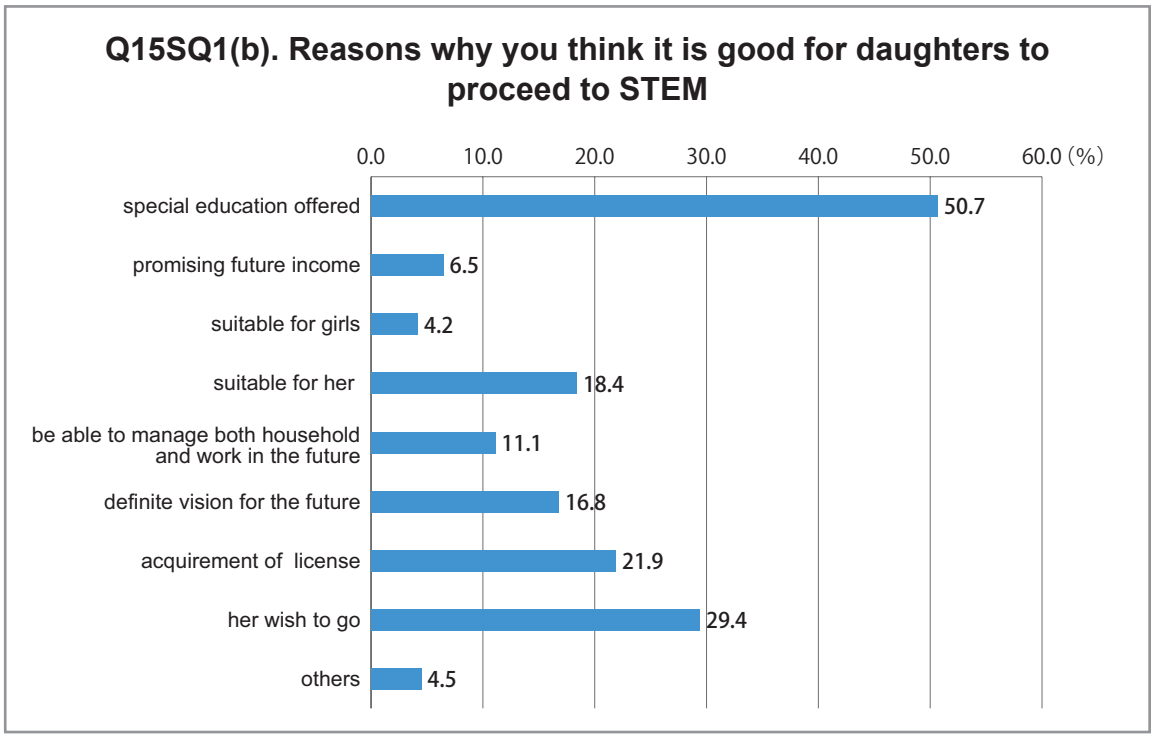
"Good" was 58.1% , followed by "relatively good" with 23.6% and thus 81.7% considered daughters proceeding to STEM positively.

3-33. Faculties in STEM which you think would be good for daughters to proceed



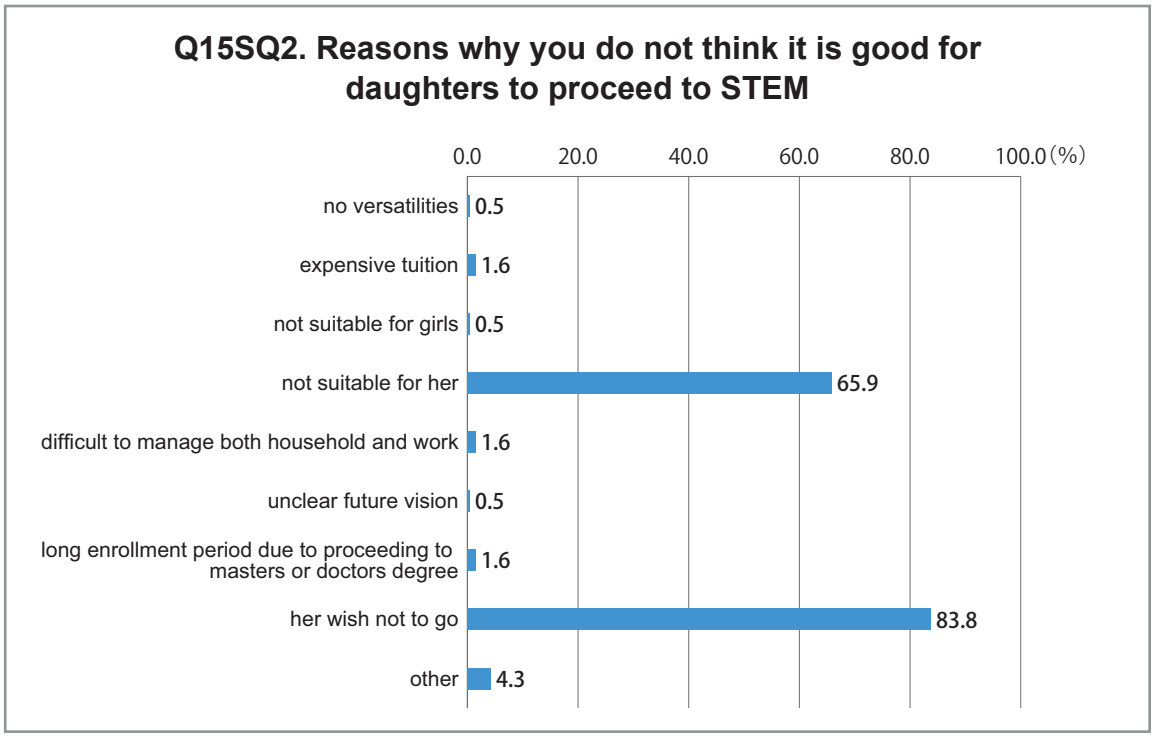
The highest was Pharmaceuticals with 39.3%, followed by Medicine with 37.0%, and Science with 30.8%.

3-34. Reasons why you think it is good for daughters to proceed to STEM



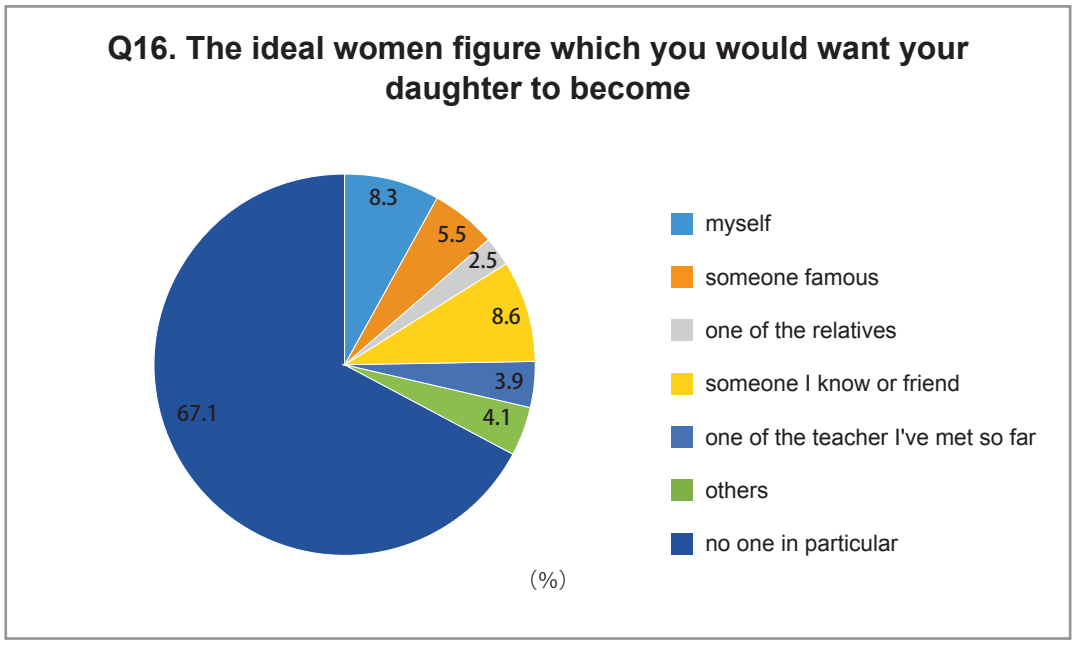
"Special education offered" was the highest with 50.7%), followed by "her wish to go", and "suitable for her" with 18.4%.

3-35. Reasons why you do not think it is good for daughters to proceed to STEM



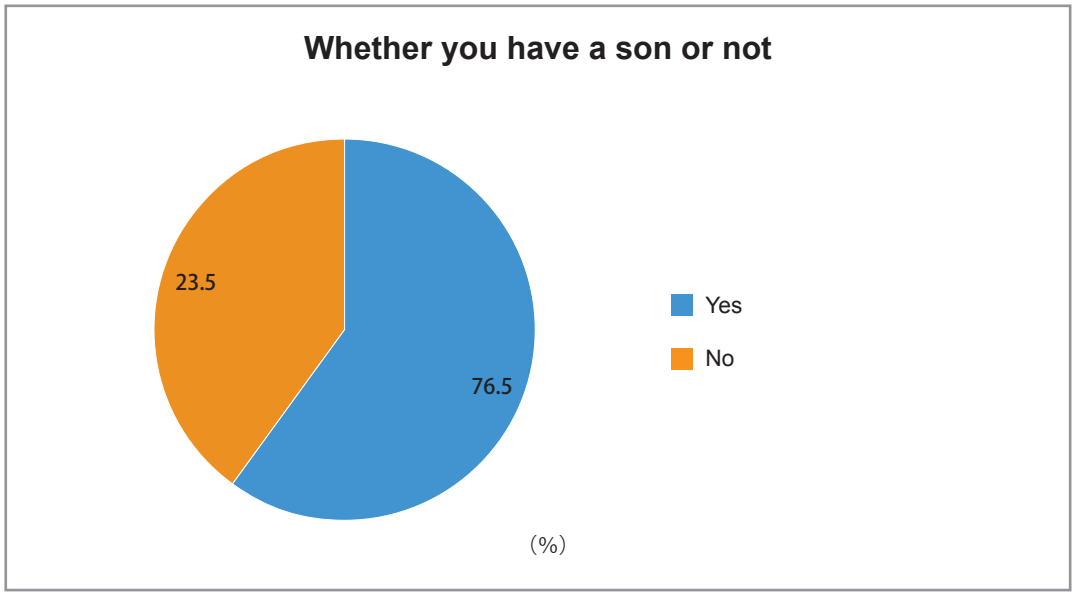
For questions to mark two answers regarding reasons why you do not think it is good for daughters to proceed to STEM, "her wish not to go " was the highest with 83.8%, followed by "not suitable for her" with 65.9%. Only 0.5% answered "not suitable for girls". In private universities, compare to non-STEM faculties , the tuitions of STME faculties are expensive , but people who chose that as their reason were only 1.6%.

3-36. The ideal women figure which you would want your daughter to become



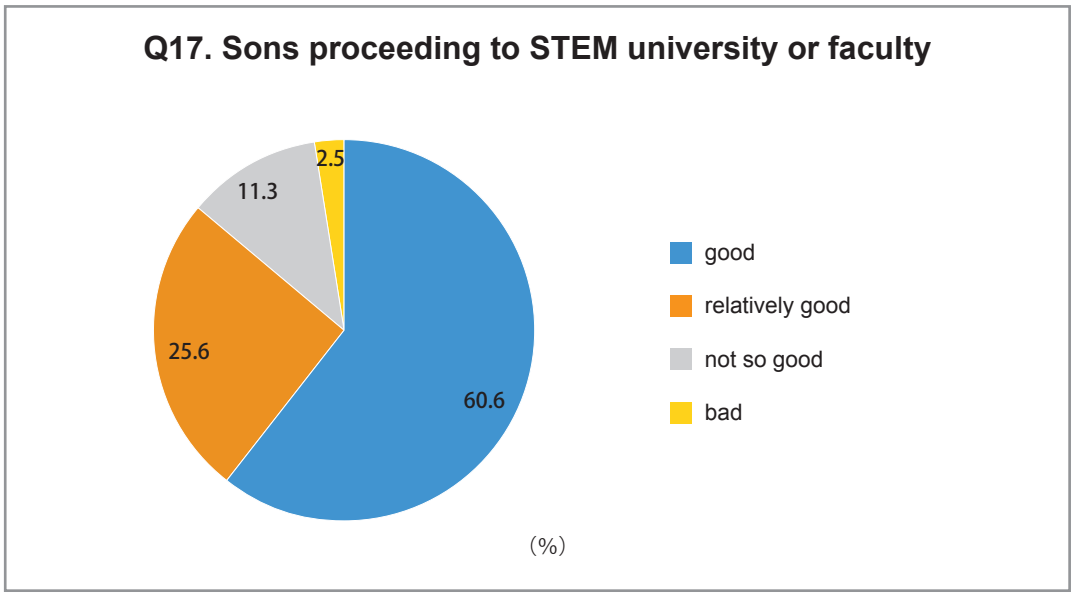
"No one in particular" was the highest with 67.1% as the ideal women figure, followed by "someone I know or friend" with 8.6%, and "myself" with 8.3%. There were only about 10 people who mentioned specific name.

3-37. Whether you have a son or not



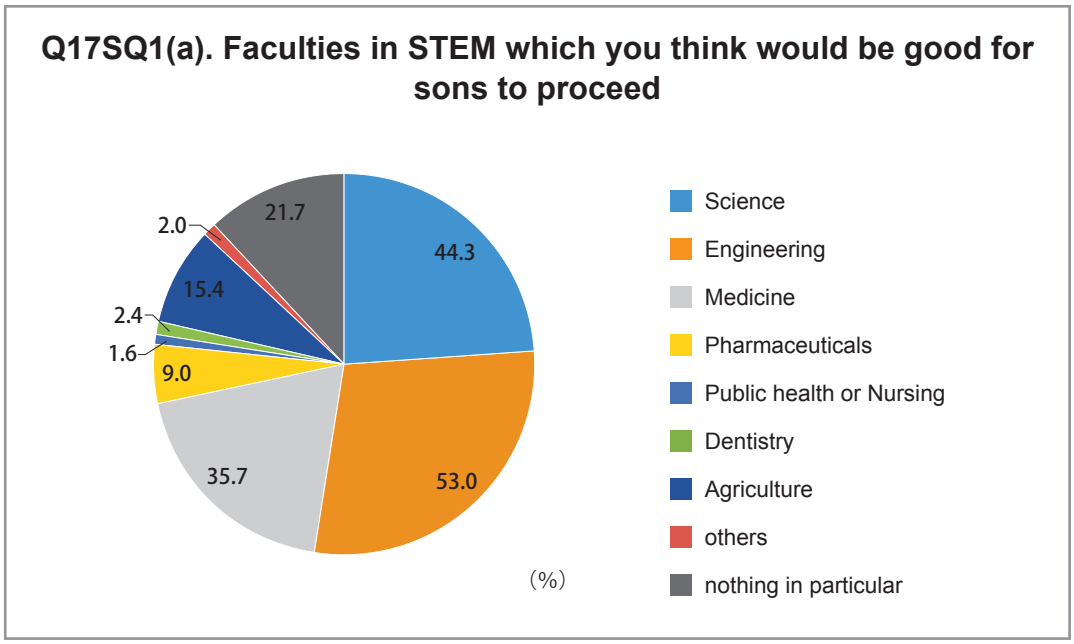
In the questionnair collected, among 1417 people with children, people with daughters were 1055 (72.9%), people with sons were 1072 (76.5%). There was not much differences.

3-38. Sons proceeding to STEM university or faculty



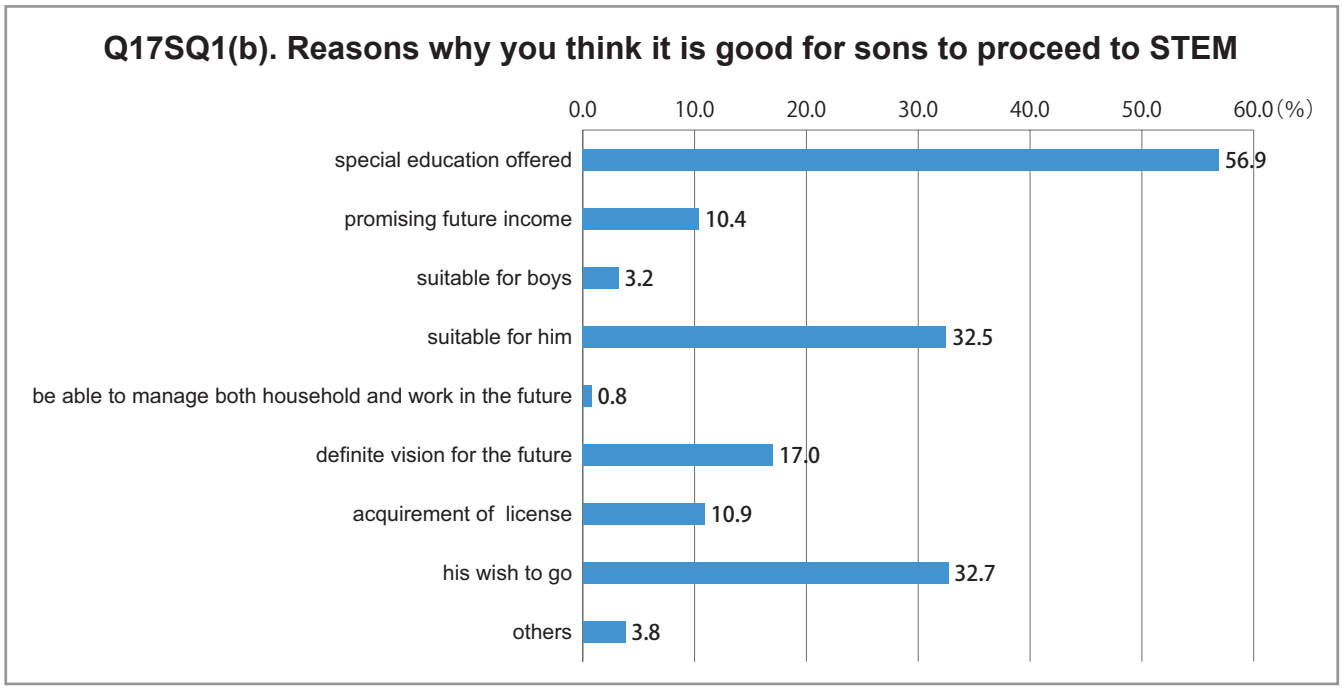
Questions for those with dauthers, the results for "dauthers proceeding to STEM university or faculty"was "good"with 58.1%, and "relatively good"with 23.6%. When the same kind of question, "sons proceeding to STEM university or faculty" was asked to those with sons, the results was"good"with 60.6%, and "relatively good"with 25.6%. There was not much difference for the expectations to the girls to proceed to STEM.

3-39. Faculties in STEM which you think would be good for sons to proceed



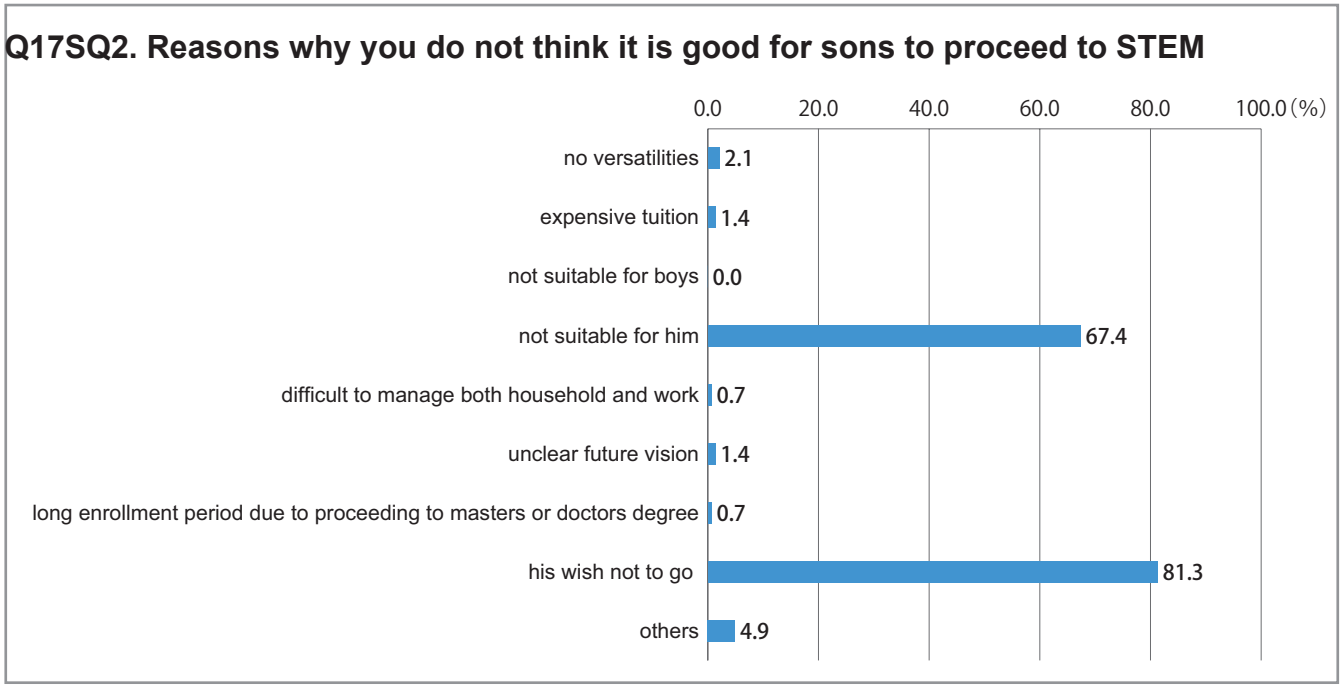
Accordin to the result of "Faculties in STEM which you think would be good for your children" (up to three), pharmaceuticals was the highest with 39.3%, followed by medicine with 37.0% and followed by science with 30.8%for daughters, while engineering was the highest with 53.0% followed by science with 44.3% and followed by medicine with 35.7% for sons. There was a significant difference between daughters nad sons. For daughters, faculties which were able to take natinal exam for licence such as pharmaceuticals and medicine were very popular for daughters while engineering was popular for sons.

3-40. Reasons why you think it is good for sons to proceed to STEM



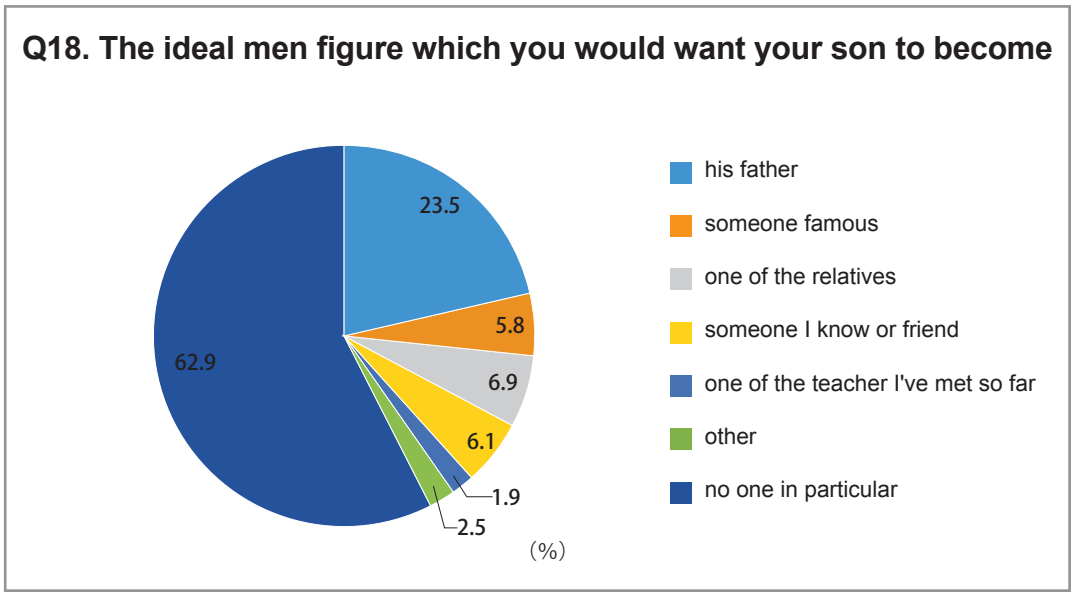
Accoring to the results of Reasons why you think it is good for sons to proceed to STEM (choose two), “special education offered” was the highest for dauthers and sons with 50.7% and 56.9%, follwed by “wish to go”with 29.4% and 32.7%. The third highest showed significant difference between duaghters and sons. For daughters, “aquirement of licence”was the hird highest with 21.9%, while for sons, the number was almost the half of dughters with 10.9%. For sons, “suitable for them”was the third highest with 32.5%, wile for daughters with 18.4% which was only 57% of the number of for sons.

3-41. Reasons why you do not think it is good for sons to proceed to STEM



Among those who answered “not so good ”or ”bad “ to go to STEM , two resons occupyed most of them. One of which, “his/her wish not to go“, occupyed 81.3% for sons and 83.8% for dauthers and “not suitable for him/her”occupyed 67.4% for sons and 65.9% for daughters.

3-42. The ideal men figure which you would want your son to become

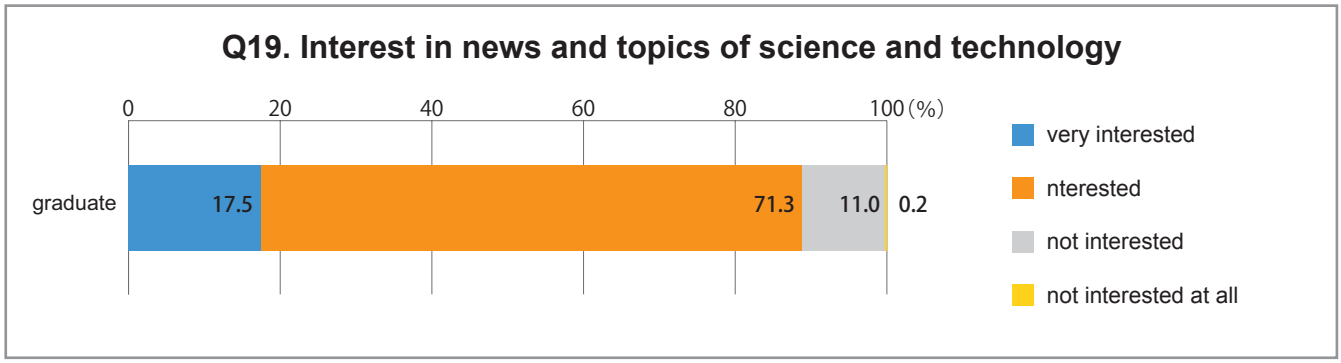


“No one in particular” was the highest answer with 67.1% for daughters and 62.9 for sons in the ideal figure which you would want your daughter/son to become. For sons, the second highest was “his father” with 23.5%.

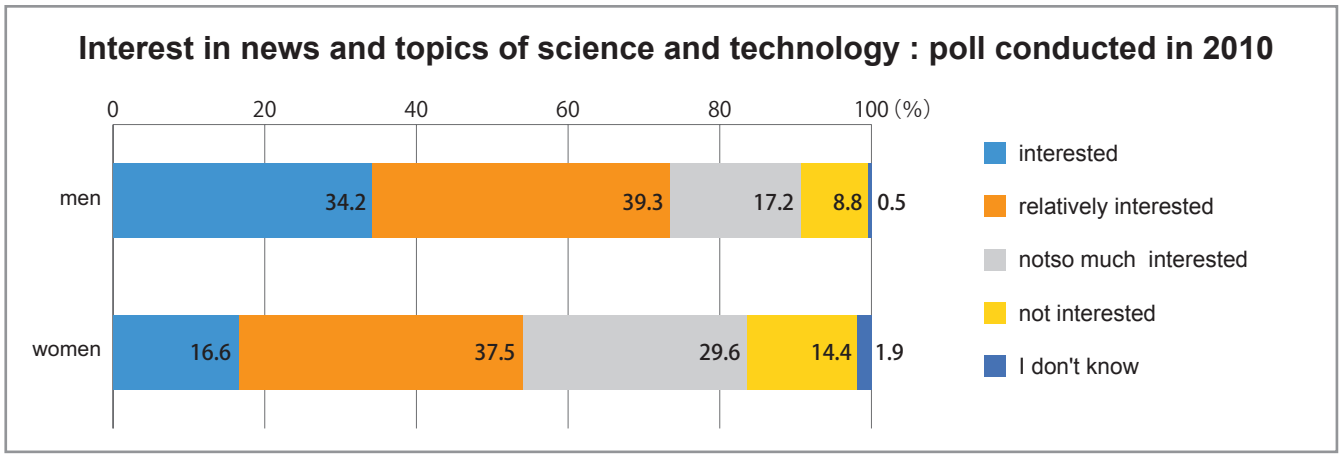
Although there was not much diferrence in the expectations to proceed to STEM among sons and daughterss, there appeared to be a significant diferrence when choosing faculty in STEM. There was the idea that enginnering faculty was suited for sons. Reason that appeared often was that it was the child wish, it was suitable for the child. It was thought that phanmacheutical faculty was for daughters. One big reason was that it was the child wish, it was suitable for child and also there was the possibility that the fact that “licence” was more preffered by the mothers for dughters than the mothers for sons.

4. About science and technology

4-1. Interest in news and topics of science and technology

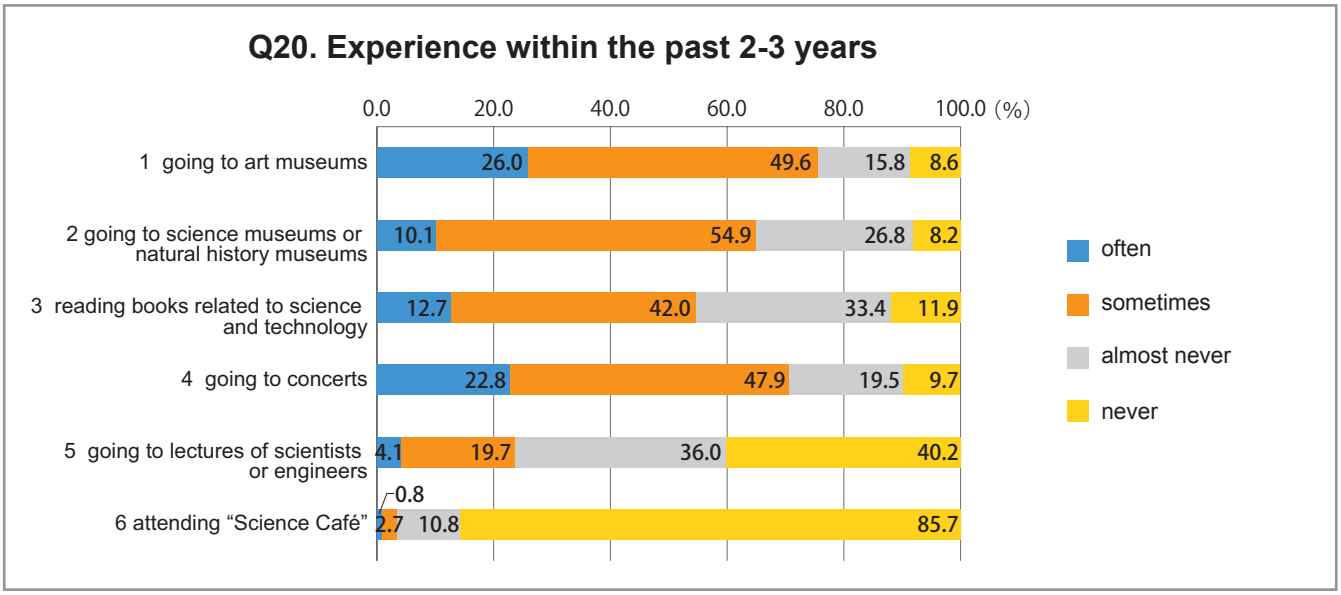


The sum of the percentage of "very interested" with 17.5% and "interested" with 71.8% was high as 88.8%.



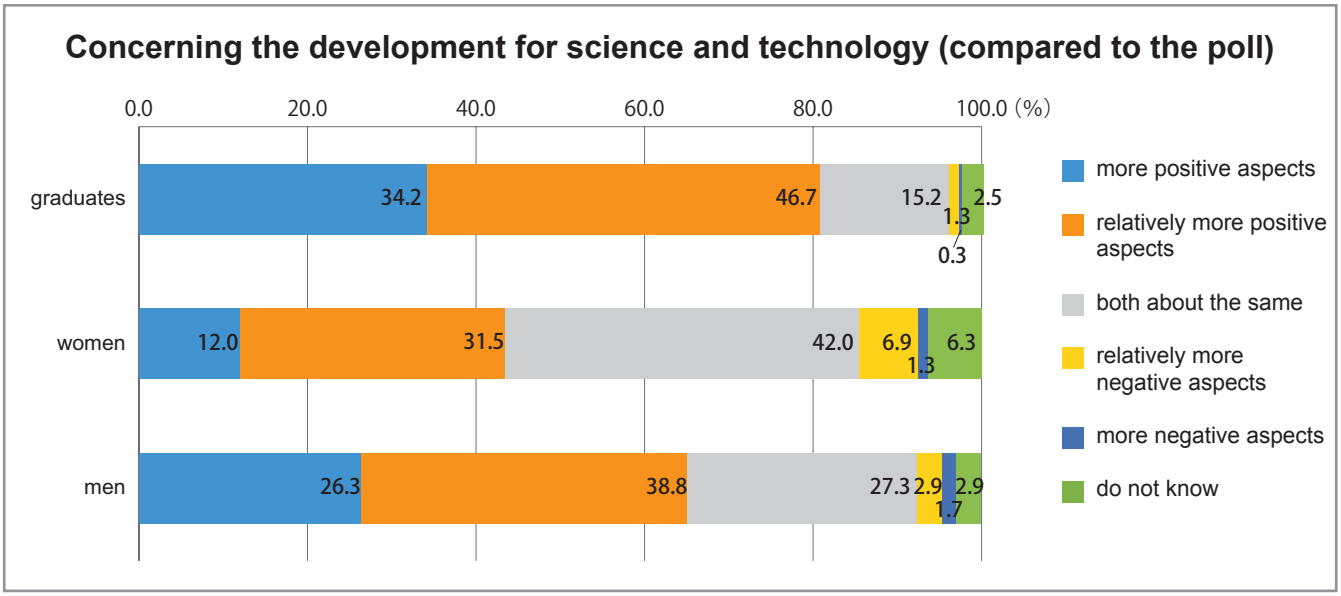
Comparing to "Report on the pole concerning the science, technology and society" by Cabinet office conducted in January, 2010, the large amount of ratio in "interested" positively clearly shown.

4-2. Experience within the past 2-3 years



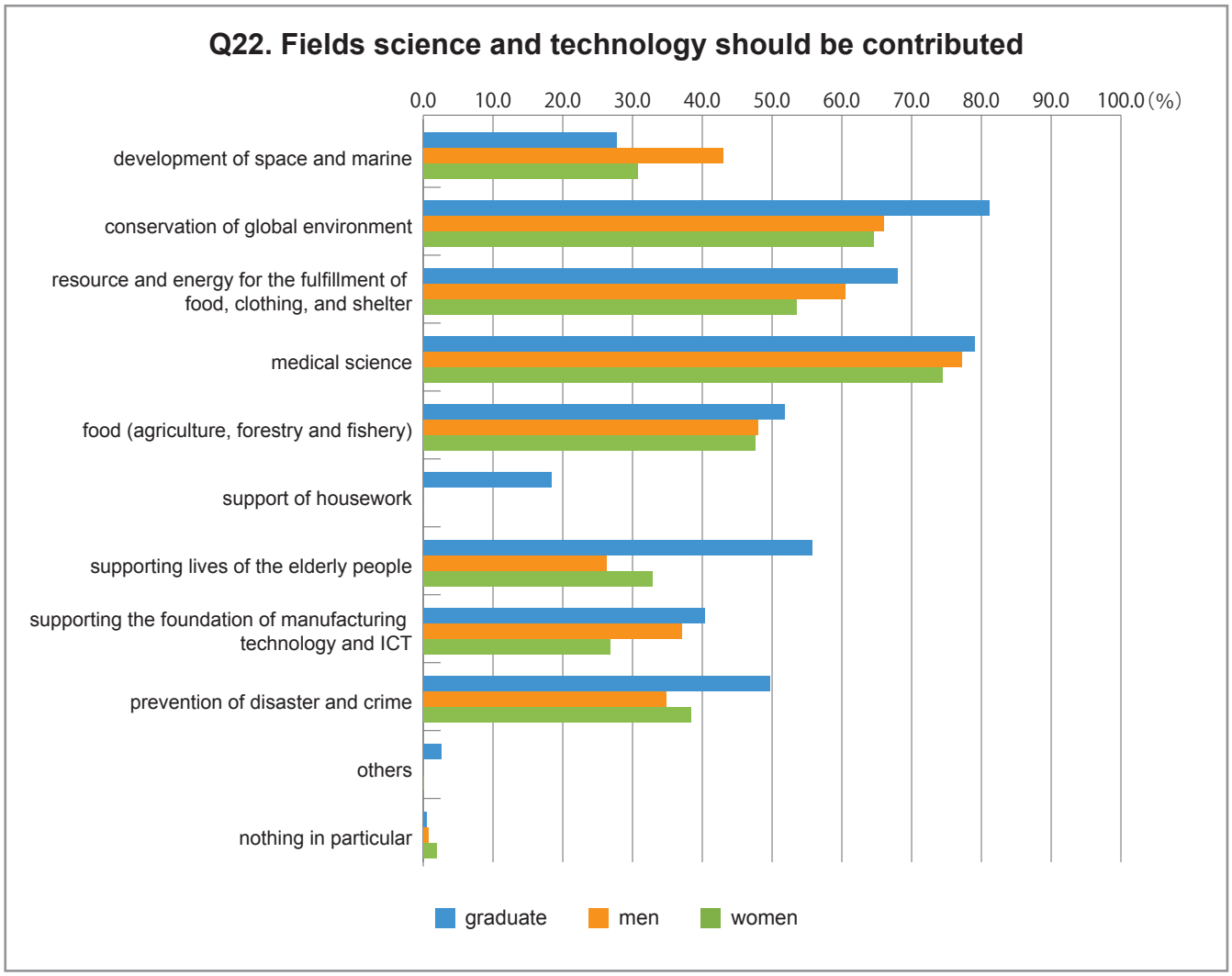
Compared to the experience of "going to art museums" or "concert", the percentage of "going to science museums or natural history museums" and "reading books related to science and technology" were small ratio. And percentage of "going to lectures of scientists or engineers" and "attending "Science Café"" were even smaller.

4-3. Concerning the development for science and technology



Compared to the poll concerning the graduates' ratio on "more positive aspects" and "relatively more positive aspects" were higher, and added together, 80.9% considered that it was a positive thinking.

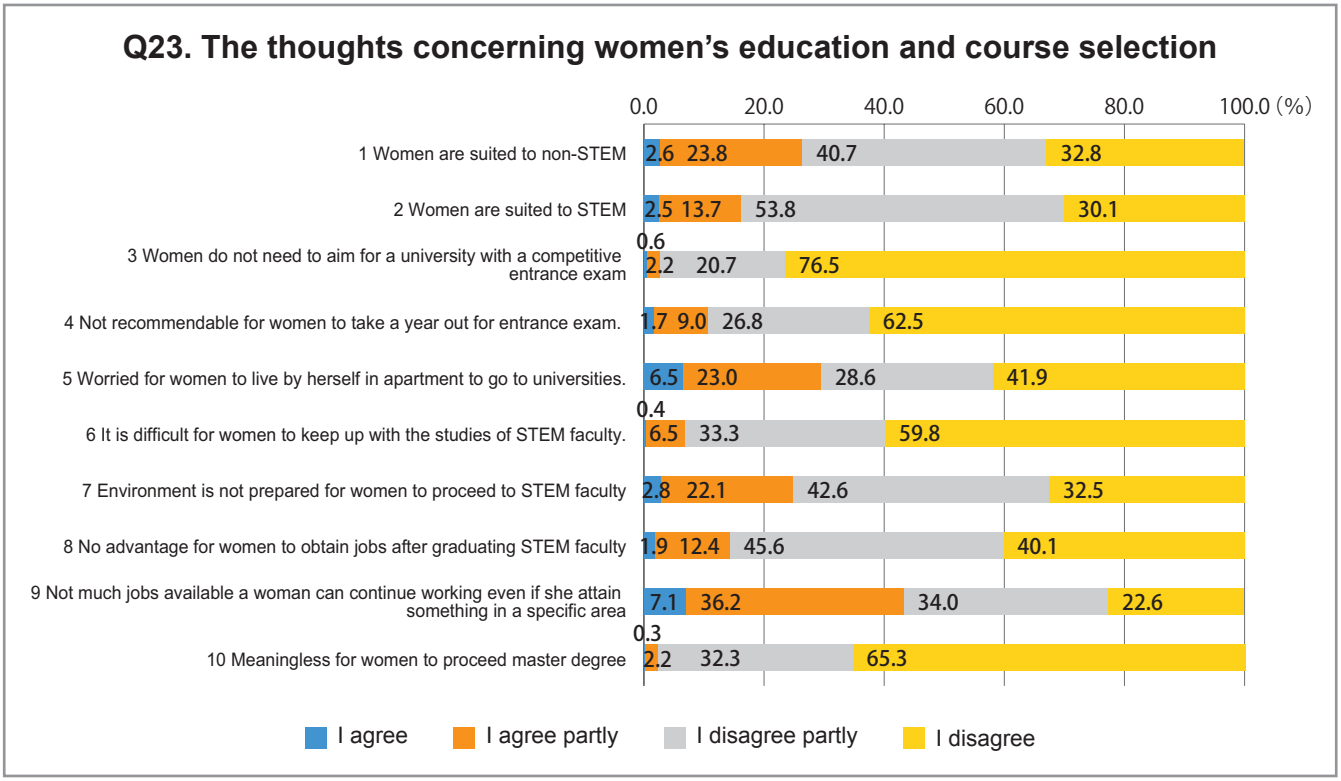
4-4. Fields science and technology should be contributed



In the field where science and technology should contribute, the graduates showed high ratio, in order of "conservation of global environment", "medical science" and "resource and energy for the fulfillment of food, clothing, and shelter". In other items except "development of space and marine" that are possible to make comparison, the percentage of graduates exceeded the ratio of average male and female citizens.

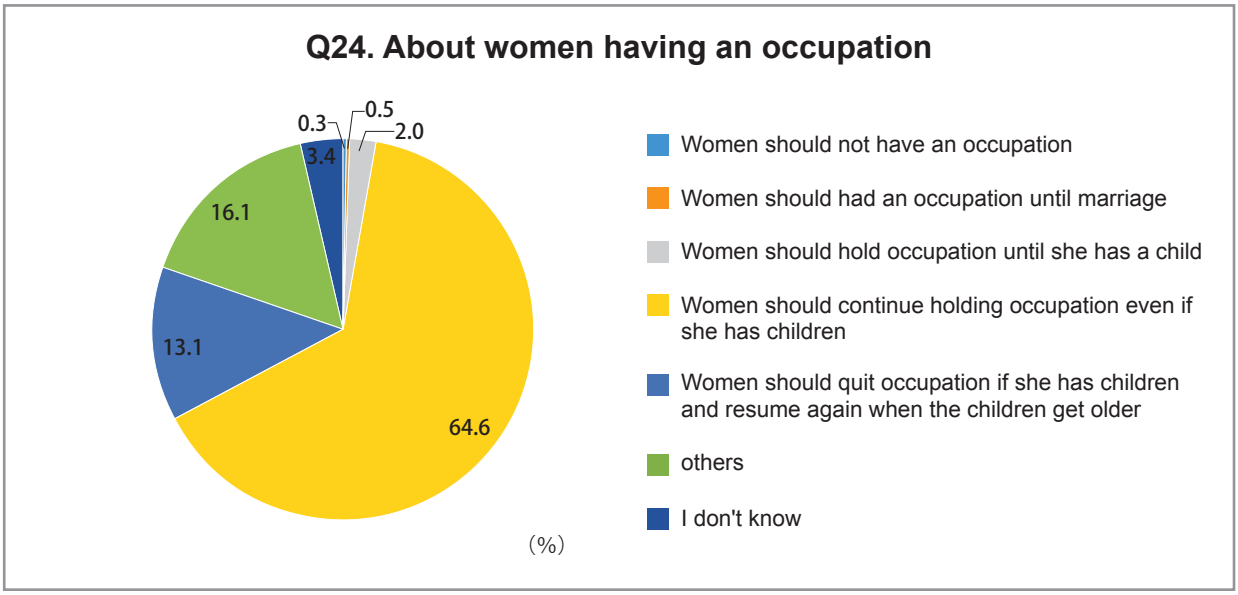
5. Women's way of life

5-1. The thoughts concerning women's education and course selection

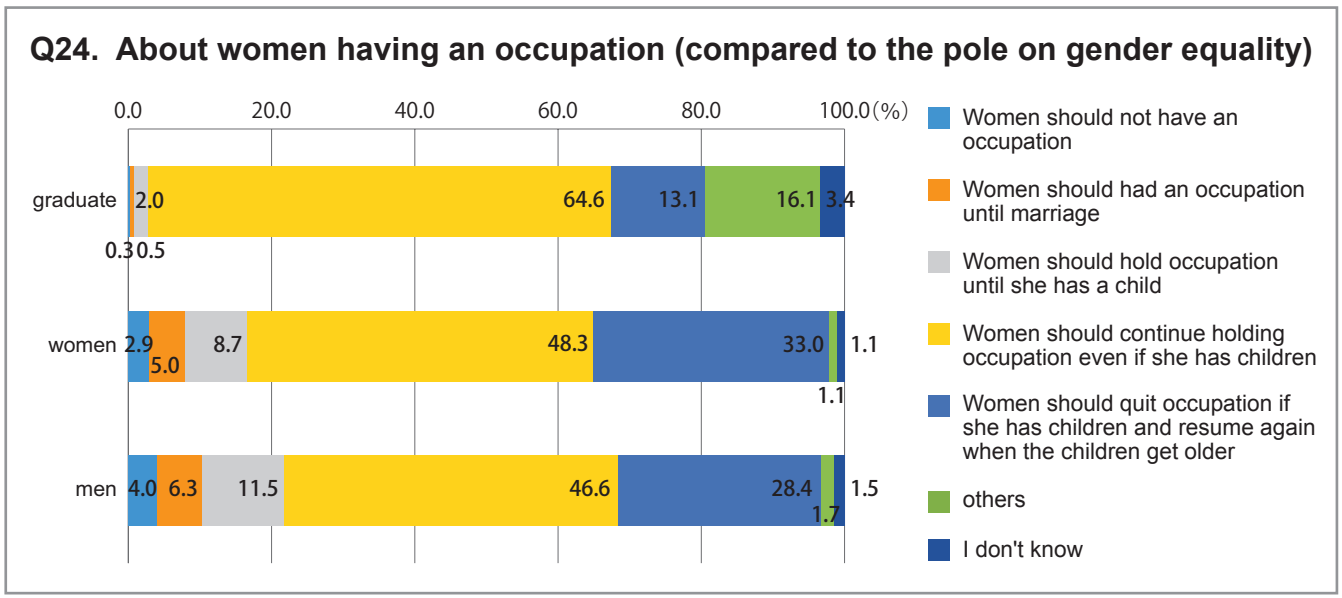


On question about the thoughts concerning women's education and course selection, the highest among the opinions of "I agree" and "I agree partly" was "Not much jobs available a woman can continue working even if she attain something in a specific area". There were more people who thought that "Women are suited to non-STEM"than "Women are suited to STEM"

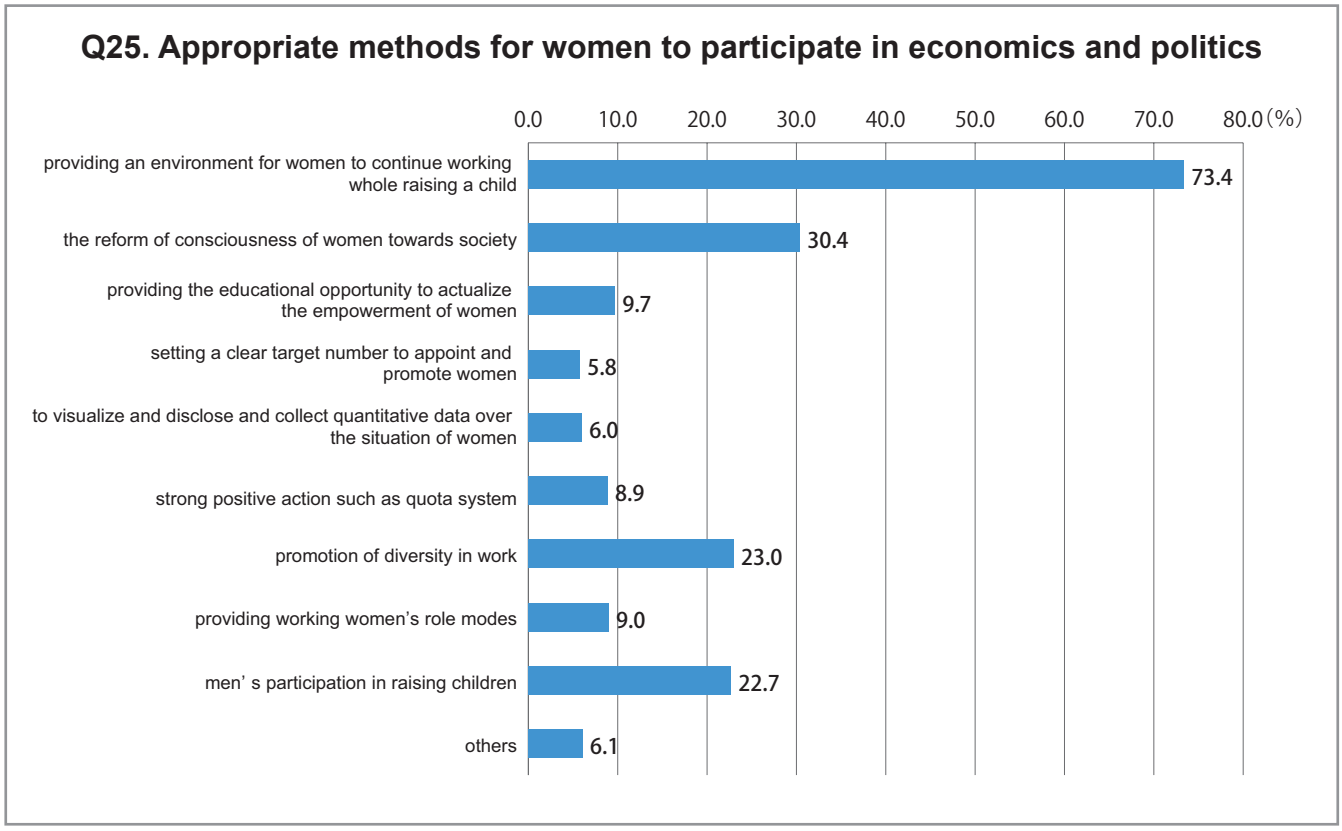
5-2. About women having an occupation



Compared to "the pole on gender equality" by Cabinet office in 2012, there were more people who support the idea to continue working with 64.6%. But on the other hand, there was characteristic that there nearly 20% answered "others" or "I don't know".



5-3. Appropriate methods for women to participate in economics and politics



The highest was “providing an environment for women to continue working whole raising a child”with 73.4%, followed by “the reform of consciousness of women towards society”with 30.4%.

Part 2 Cross Tabulation

1. Analysis of the cohort of graduate year

As seen in the simple tabulation, out of the answerers of this research, there were 1055 people with girls and 1072 this boys, but in this section, we will see the difference of the mothers' (graduates') conscience over children's choice for STEM course concerning the graduates years.

We will specifically use of the cohort of graduate year that is divided into 4 groups before and after 1986 when the Equal Employment Opportunity Law came into effect and front and behind. Also, for analysis we used the answer for their first child (Q15, Q17) and see in or der of

(A) Evaluation of course choice for stem (affirmation/denial)

(B) Faculty that the affirmation group want to encourage to the children

(C) The reasons the affirmation group want to encourage to STEM course

(D) The reasons the denial group refuse to proceed to STEM course

1-1. About the data

If classified sorted out as mentioned above, the cohort of graduate year is divided into 4 as year from 1966-1975, 1976-1985, 1986-1995, 1996-2005. From the following, these years will be shown as 1975, 1985, 1995, and 2005. Also the data for each the cohort of graduate year whether they have children or not is sown in the following chart.

Children's gender according to the cohort of graduate year

		cohort of graduate year				total
		1975	1985	1995	2005	
those who have a daughter	number	204	251	260	192	907
	%	22.5%	27.7%	28.7%	21.2%	100.0%
those who have a son	number	215	262	255	203	935
	%	23.0%	28.0%	27.3%	21.7%	100.0%

1-2. Tendency of the answers for proceeding to STEM university or faculty

(A) Evaluation of course choice for stem (affirmation/denial)

We asked about the evaluation of the child proceeding to STEM university or faculty in four stages, Q15 for the first born daughter, Q17 for the first born son. The answers were compiled in the chart below.

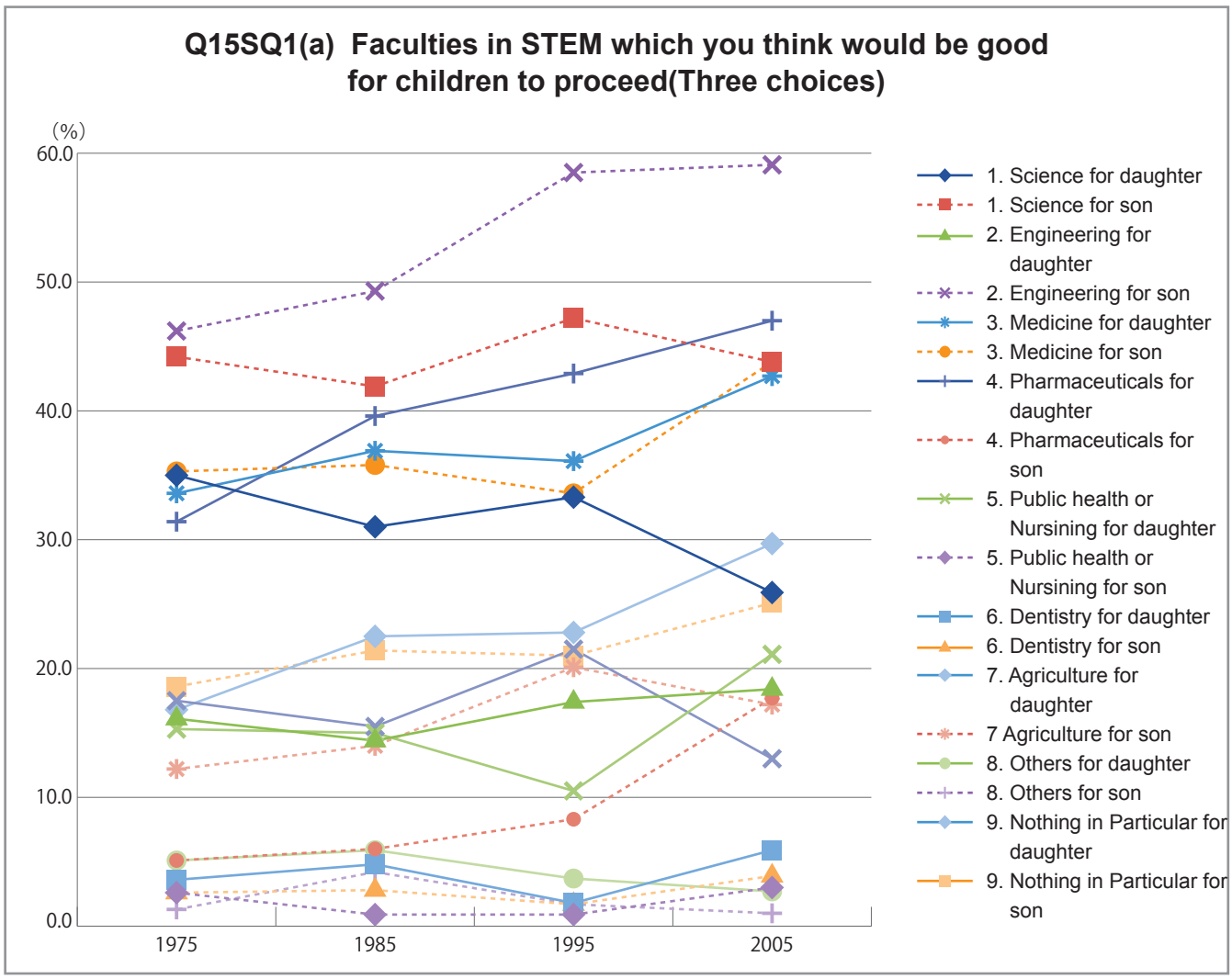
group of graduated year		good	relatively good	not so good	bad	no answer	total
1975	daughter	45.1%	22.1%	17.6%	8.3%	6.9%	100.0%
	son	51.2%	21.4%	19.1%	2.3%	6.0%	100.0%
1985	daughter	52.2%	22.3%	15.9%	6.8%	2.8%	100.0%
	son	55.3%	26.7%	11.5%	4.6%	1.9%	100.0%
1995	daughter	61.2%	23.1%	10.4%	2.3%	3.1%	100.0%
	son	62.0%	27.8%	7.5%	1.2%	1.6%	100.0%
2005	daughter	71.4%	25.0%	2.1%	0.0%	1.6%	100.0%
	son	73.4%	26.6%	0.0%	0.0%	0.0%	100.0%
total	daughter	57.2%	23.0%	11.8%	4.4%	3.5%	100.0%
	son	60.1%	25.8%	9.6%	2.1%	2.4%	100.0%

The chart shows that the ration of people who though that it was “good”that their first born proceeded to STEM university or faculty becomes higher as the graduate year becomes recent, and it has become over 70% in recent years. In 2005 cohort, there was no one who answered “bad”for the girls and “bad”or “not so good” for boys.

When looking at difference in gender for the answer “good”, there was a 6% difference in 1975 within the gender of the child, but that has diminished to 3% in the graduates of 1985, and from then on, there is no t much difference among the gender of the child. Also, when comparing 1975 and 2005, the increase in the percentage of mothers (graduates) who chose “very good” to proceed to stem is somewhat more in parents of girls than parents of boys (22%). As seen in this way, the percentage of parents affirming the child to proceed to STEM when entering university is increasing more and more recent years, and the difference in gender is also decreasing.

(B) Faculties that affirmative group recommends their children to go

Next, when we asked the respondent who answered “good” or “relatively good” to proceed to STEM to choose 3 faculties that they particularly thought was “good faculty to proceed”, the result was as follows.

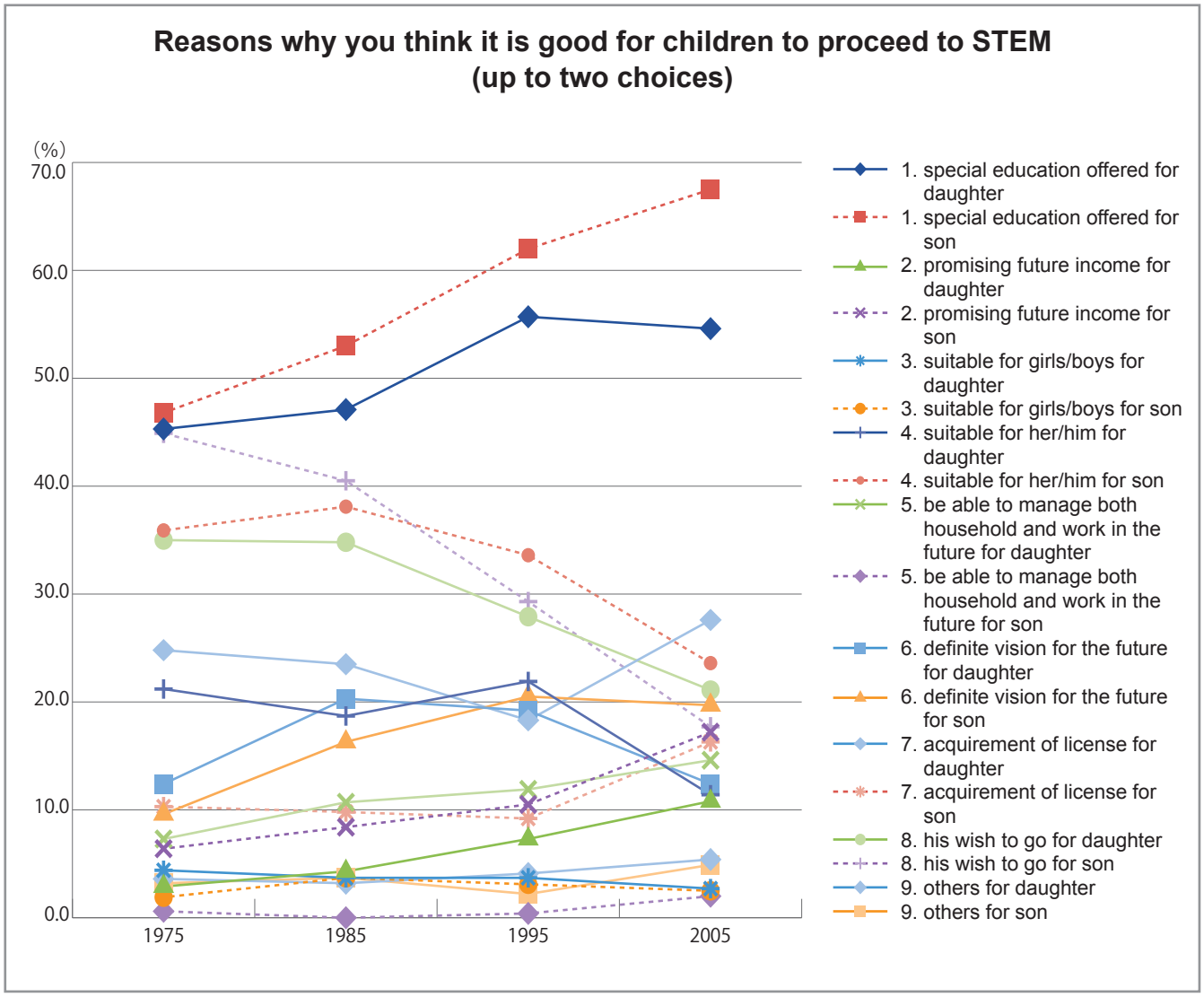


Mothers (graduates) who encourage their sons to go to “engineering faculty“ is most common in all the cohorts, and that ration is increasing more and more in recent years. This tendency toward the boy is particularly obvious between 1985-1995. For girls, within the same stage, there is a small figure of increase, but it is a change of only about 15-20%. “science faculty” is not as much as “engineering faculty”, but the response rate for the boys is high and in 2005 the ratio for wanting to encourage to the girls decreased than the previous years, so the difference between the girls and boys increased. For “medical faculty”the difference between the gender was not seen among any cohorts and both were level off and the increase toward 2005 was obvious. There was an overwhelming number of girls in all cohorts for “pharmaceutical faculty” and “”Health and nursing faculty”. Furthermore, the mothers (graduates) who chose “not specifically” is increasing regardless of the child’s gender, but that tendency is stronger for girls’ mothers, so even if even girls’ mothers had a positive picture for STEM choice, it could be assumed that it was difficult for them to point out a particular faculty.

(C) The reasons affirmative group recommend to proceed to STEM

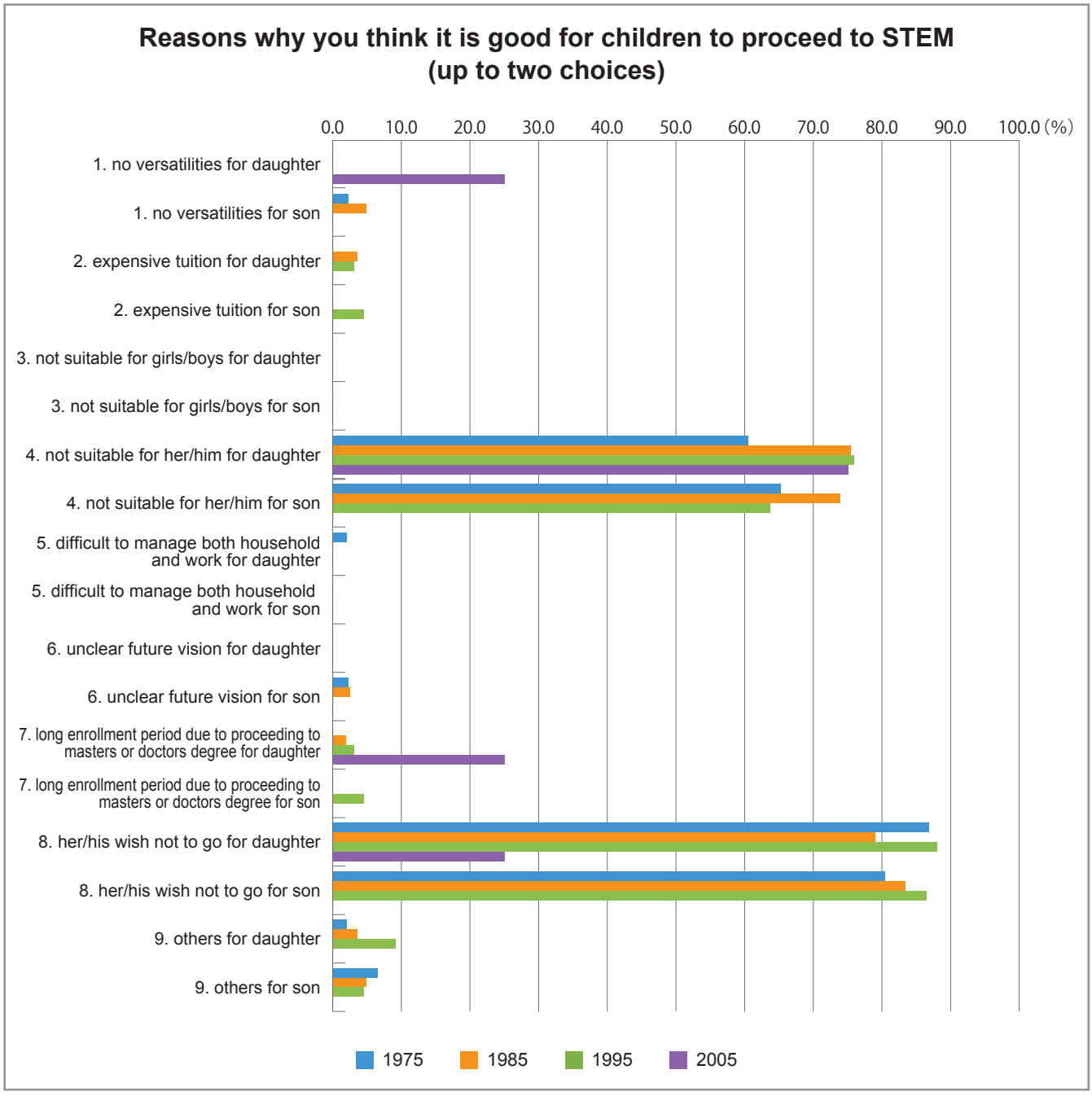
Next, when we asked the reason to who took proceeding to STEM in a positive picture, the result became as the following chart. In every graduate cohort and in any gender, “special education offered” was the most popular reason for encouraging STEM procedure. And the increase between 1985and 1995 is relatively high. Also, that ratio is higher for answerers for boys than for girls in any year and that difference is increasing more and more in recent years. For girls, while there was a 10% increase within 1975 to 2005, for boys it was only 20%. There can be seen a tendency of decline

in ratio for the child himself/herself being responsible (suitable for child/ child's wish) being the reason. The ratio for "suitable for child" is within 1995 to 2005 is decreasing regardless of the child's gender. The decrease in the ration for "child's wish" is remarkably clear in 1985 and 1995 and in between 1995 to 2005 among the boys. In every cohort, the ration of choosing "income" for boys, "acquirement of license" for girls cover great number. Also, there is a tendency of increase in mothers (graduates) of girls who chose" be able to manage both household and work in the future" and in 2005 the number doubled (14.6%) compared to 1975. From above, it become clear that although the number of mothers (graduates) who are affirmative about proceeding to STEM is increasing, the reason differs with for the gender of the child.



(D) The reasons negative group do not think proceeding to STEM good

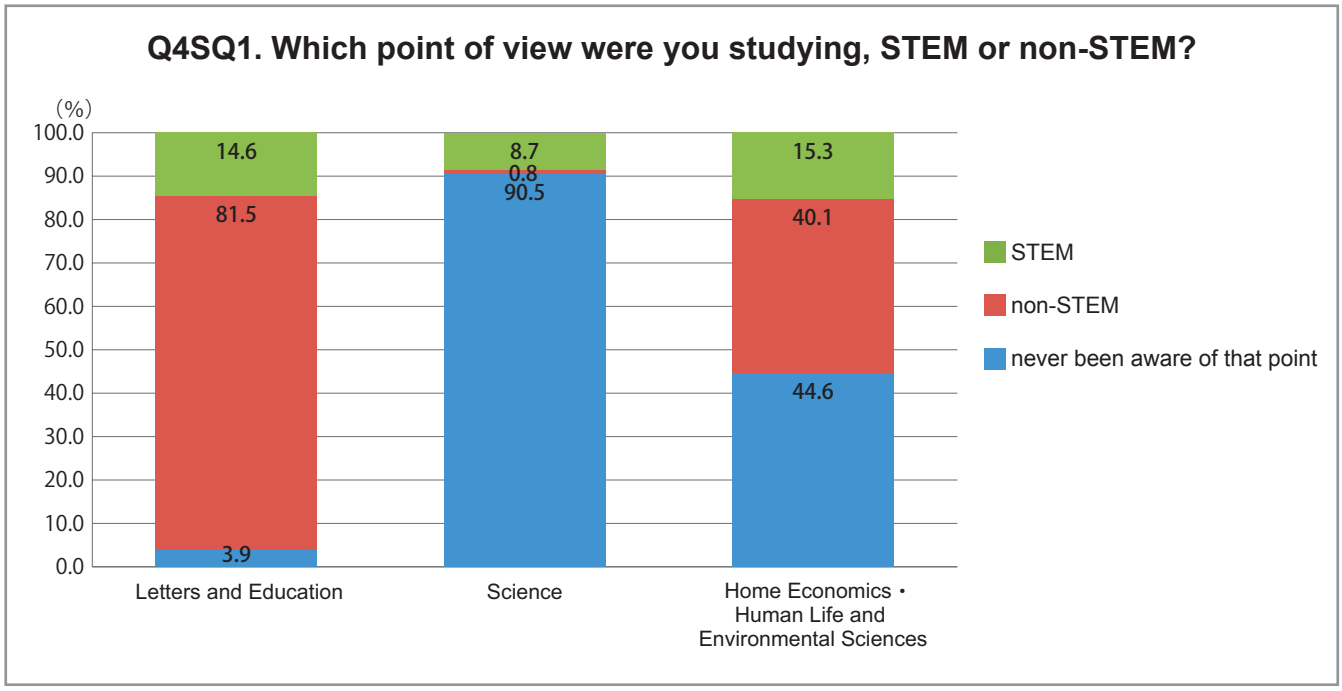
When we asked the reason for negative attitude toward proceeding to STEM, the answers resulted as follows.



As mentioned before, there are more respondents who take it positively than those who take it negatively, and this number increasing in recent years. And in each cohort, regardless of the gender, the child himself/herself being responsible (suitable for child/ child's wish) shows an high ratio as the reason for t not liking proceeding to STEM. It is necessary to investigate further in what aspect the respondent is capturing "suitable or not suitable for child" and "wish or not wish of child".

2. Analysis of the differences among the graduates from STEM or non-STEM faculty

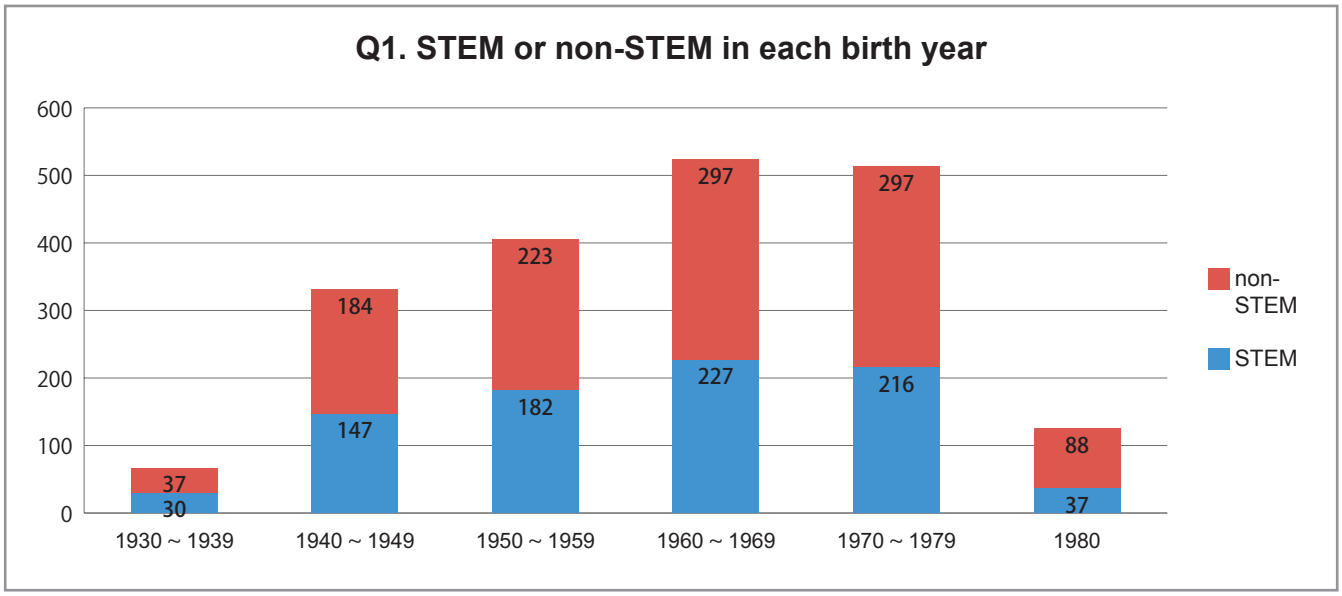
We analyzed the kind of differences whether the graduates is STEM or non-STEM and also the differences on how she deals with her child/ children. However there is no clear distinction between STEM and non-STEM, so we made a research to find out on which point of view she was inclined. The faculty of Ochanomizu University is classified into Faculty of Letters and Education, Faculty of Science, Faculty of Human Life and Environmental Sciences. The question for the classification for STEM or non-STEM was Q4SQ1, whereas the ration of "1 rather from the STEM point of view", "2 rather from the non-STEM point of view", "3 never been aware of that point" were as follows.



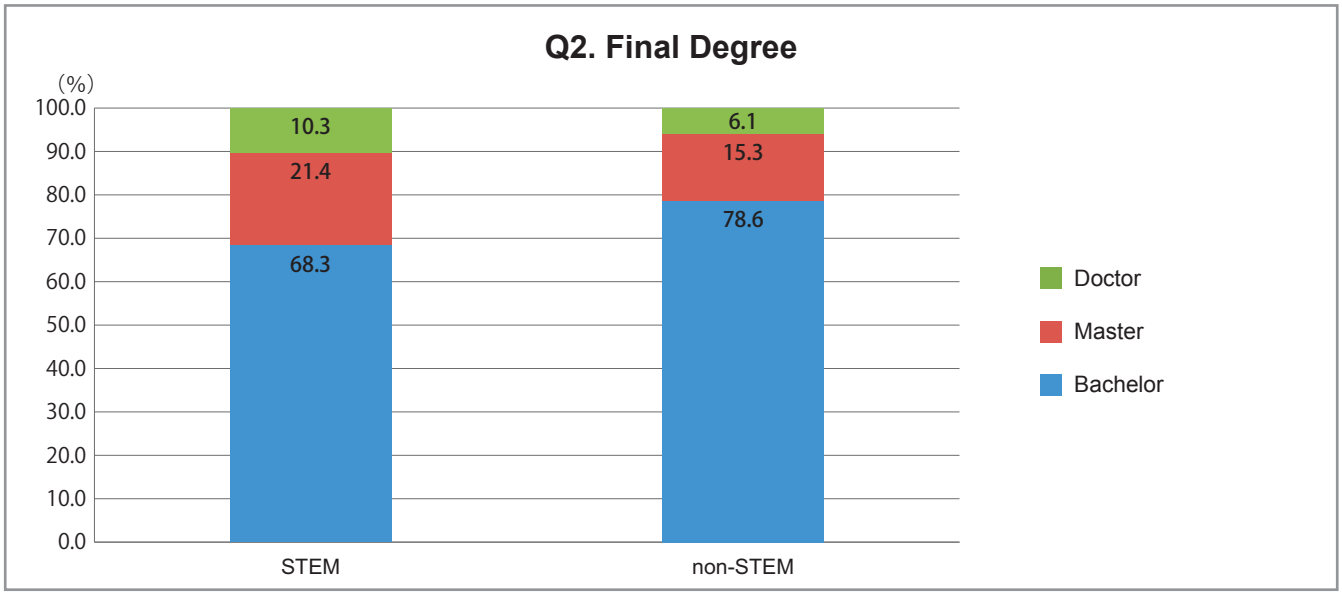
So we analyzed if there were more graduates who chose "rather from the STEM point of view", " than "rather from the non-STEM point of view", " we classified that as STEM and if there were less, that was classified as non-STEM. As a result of that, all science faculty became "STEM", all faculty of Letters and Education became "non-STEM". Nobody studied the department of "Food", "Life and Environmental Science". Among the Faculty of Home Economics/Human Life and Environmental Sciences", few people studies rather from the non-STEM point of view in the department of "food", "Life and Environmental Science", and Nutrition and Food Science" and most was STEM. Majority in department of clothing learned from Stem view, as 56.5% and it outnumbered 34.3% of non-STEM point of view. Then, we classified as department of "food", "Life and Environmental Science", Nutrition and Food Science", and "Clothing" as "STEM". Thus, STEM graduates resulted in 839 (42.7%) and non-STEM graduates as 1126 (57.3%).

Below are the accounts of items that showed characteristics in the cross tabulation of STEM graduates and non-STEM graduates.

2-1. Difference between STEM graduates and non-STEM graduates concerning birth year or faculty

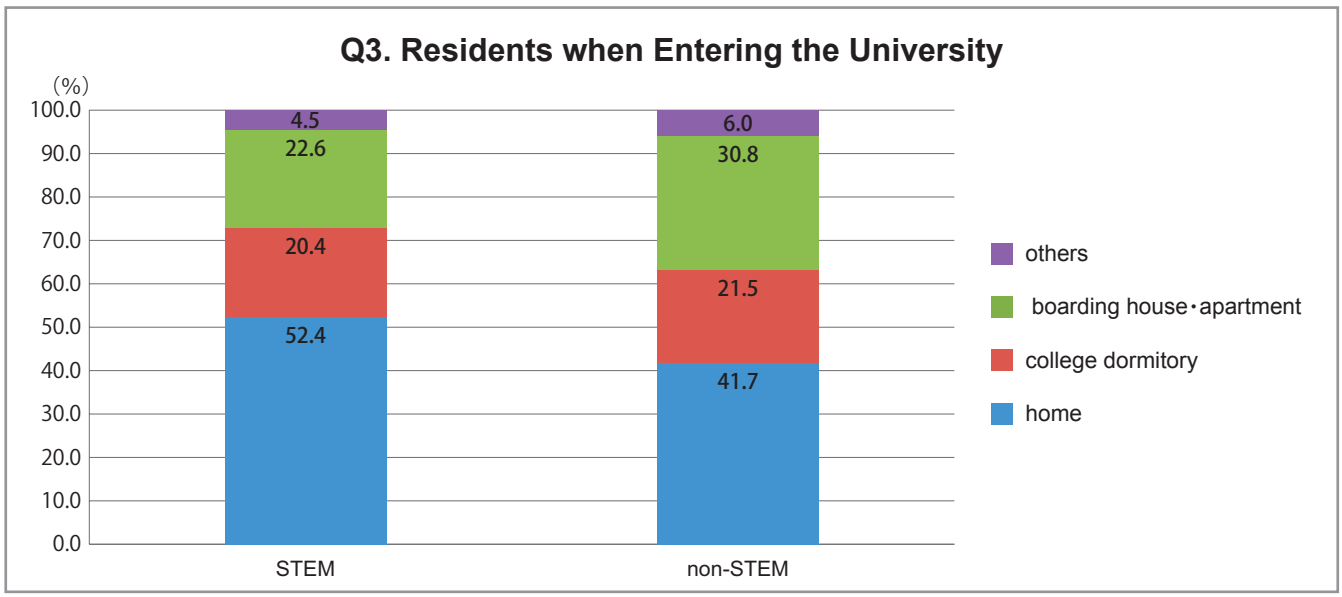


The ratio of graduates from STEM departments born after 1980 resulted in a small amounts as 29.6%. In the year excluding that generation, the STEM resulted between 42% and 45%.



$\chi^2 = 26.49$, $df = 2$, $p < .001$

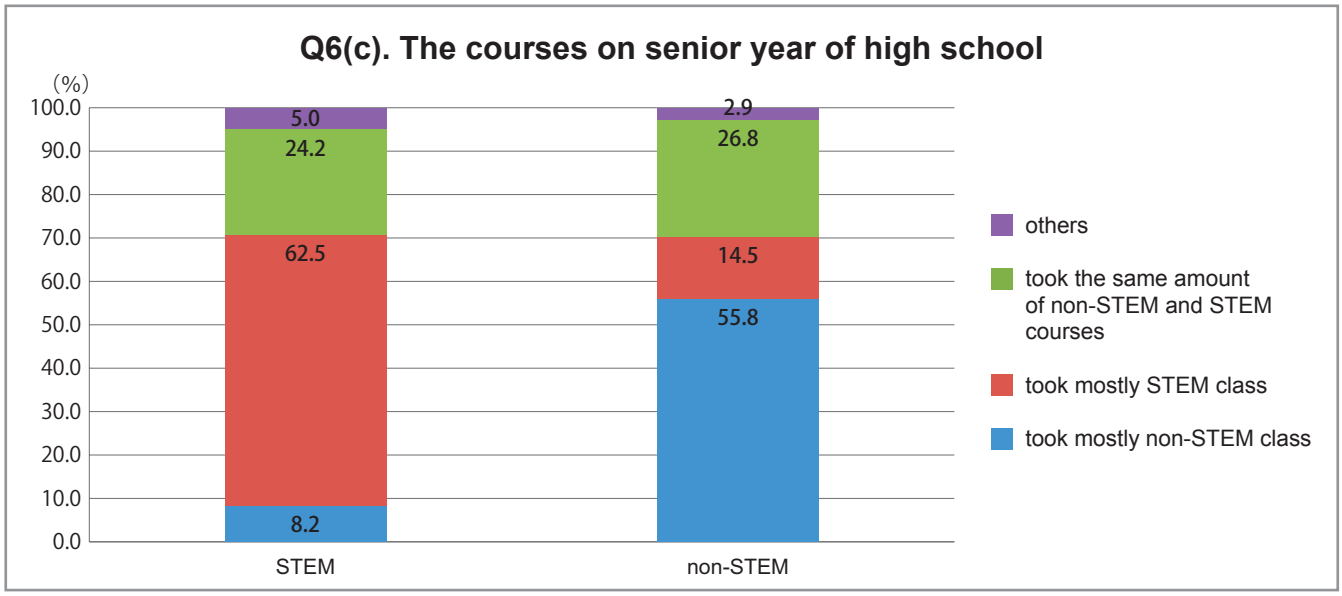
A significant difference can be seen in the final degree. There is a higher ration in STEM than in non-STEM; in master, the difference is 6.1%, doctors 4.2%. In graduate schools, there is a higher ration of STEM, summed up to 10.3%, and there is a tendency for higher academic achievement. There was no difference in graduate date and month.



$\chi^2 = 25.83$, $df = 3$, $p < .001$

Concerning the residents when entering the university, significant difference could be seen. Both in STEM and non-STEM, “home” was the highest and STEM graduates was 10.7% higher than non-STEM graduate. In “boarding house / apartment” and “college dormitory”, the percentage of STEM was lower than non-STEM. There was no difference in “whether anybody oppose the decision on your choice of course”.

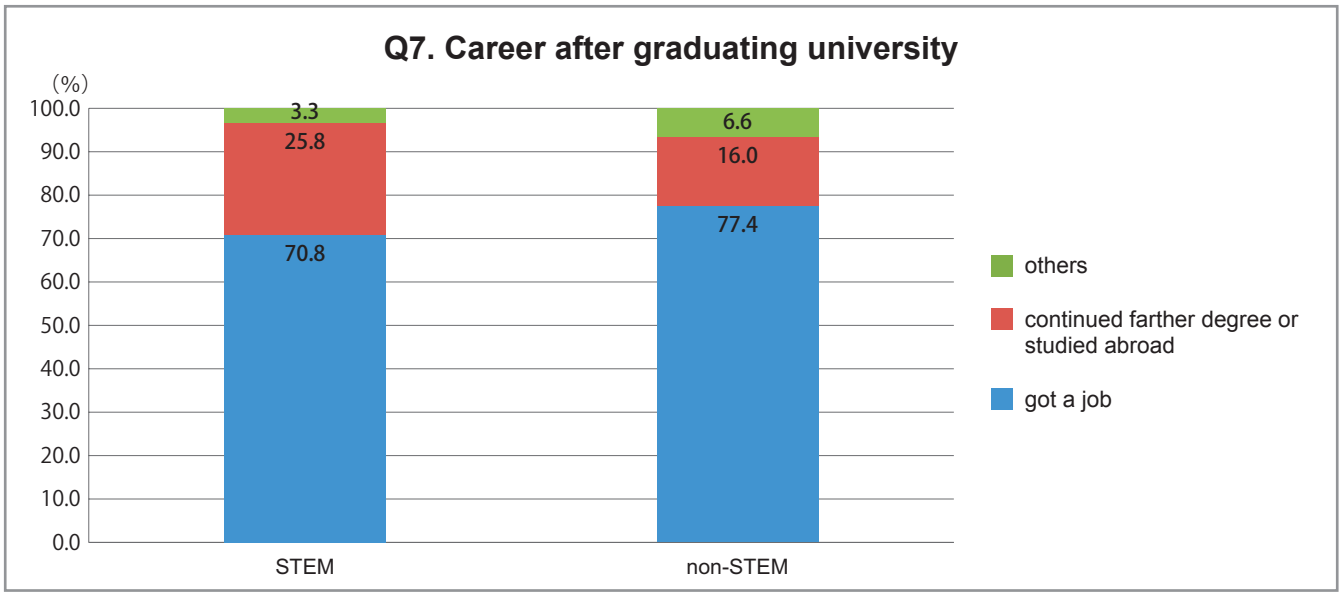
2-2. The difference until entering University within STEM and non-STEM



$\chi^2 = 628.9$, $df = 3$, $p < .001$

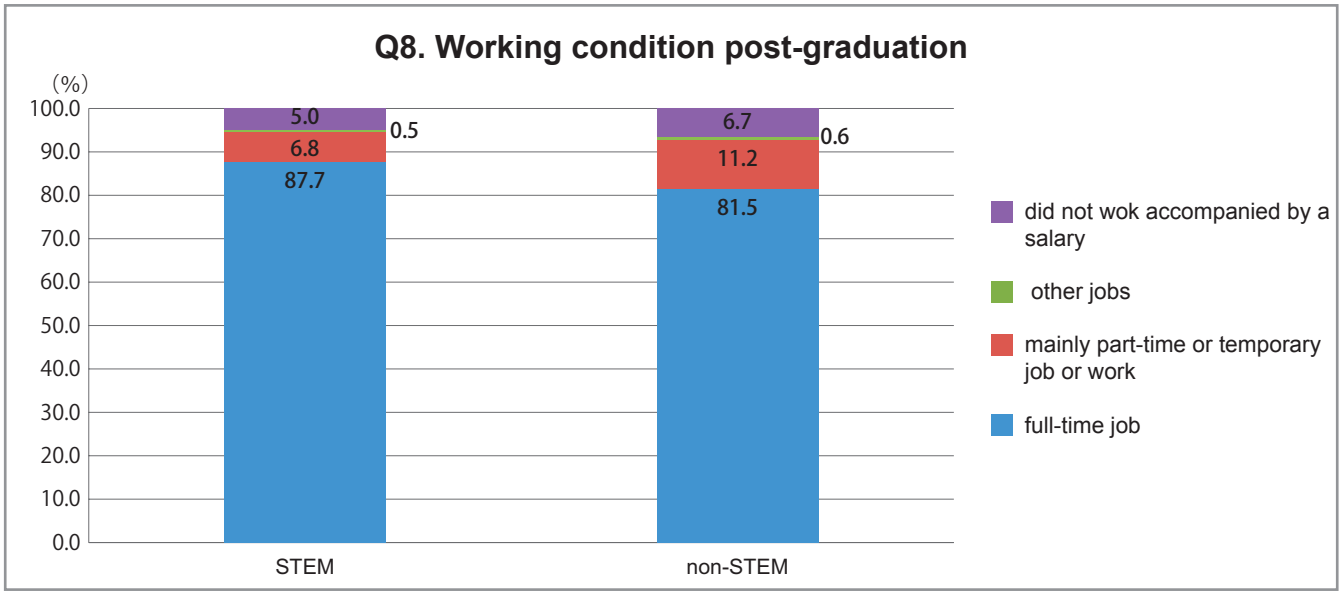
There is a significant difference in the class of senior year. In STEM, “took mostly STEM class” resulted in the highest percentage and it was 62.5%. In non-STEM, “took mostly STEM class” was the highest percentage with 55.8%.
There was not any difference in “the nature of establishment of alma mater high schools”,” co-ed or all girls’ high school””, and ”gender of teacher who mainly did academic and career counseling” between STEM and non-STEM.

2-3. The difference between STEM and non-STEM concerning occupation and marriage after graduation



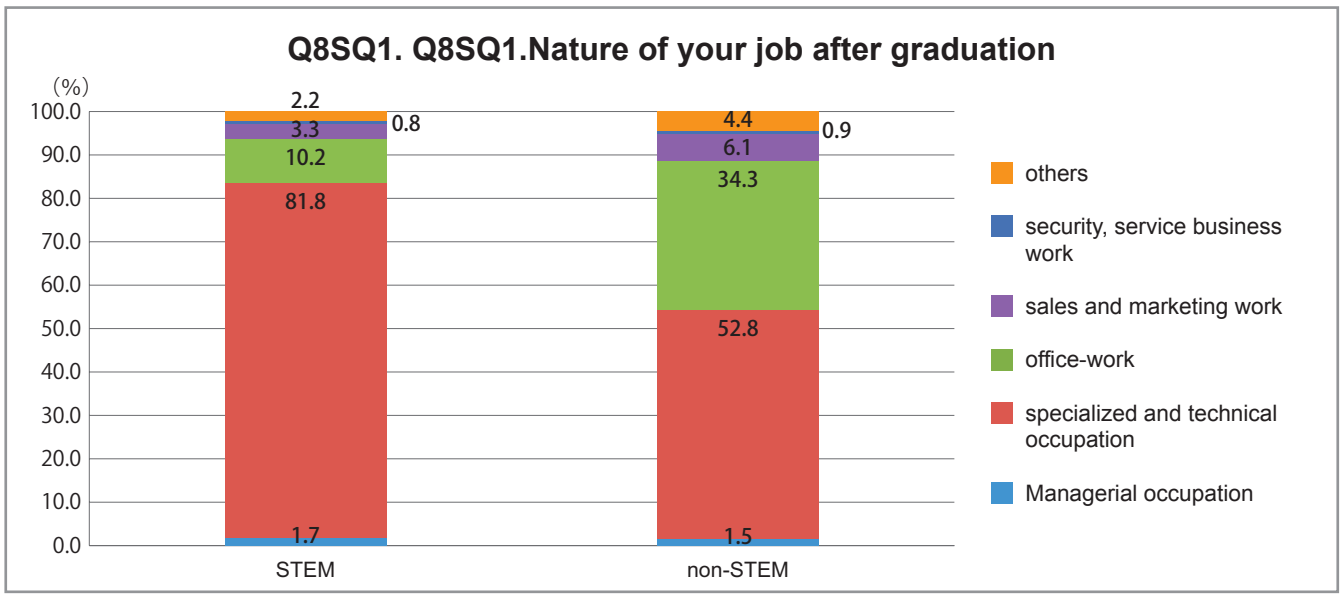
$\chi^2 = 35.4$, $df = 2$, $p < .001$

The difference among STEM and non-STEM concerning occupation and marriage after graduation. There was a significant difference in the choice of career path that the graduates took after graduation. There are more graduates in STEM who choice to continue to pursue further study after graduation compared to non-STEM 9.8% more graduates went to further studies. From this data, assumptions can be made that there are more graduates with a master's degree in STEM than in non-STEM.



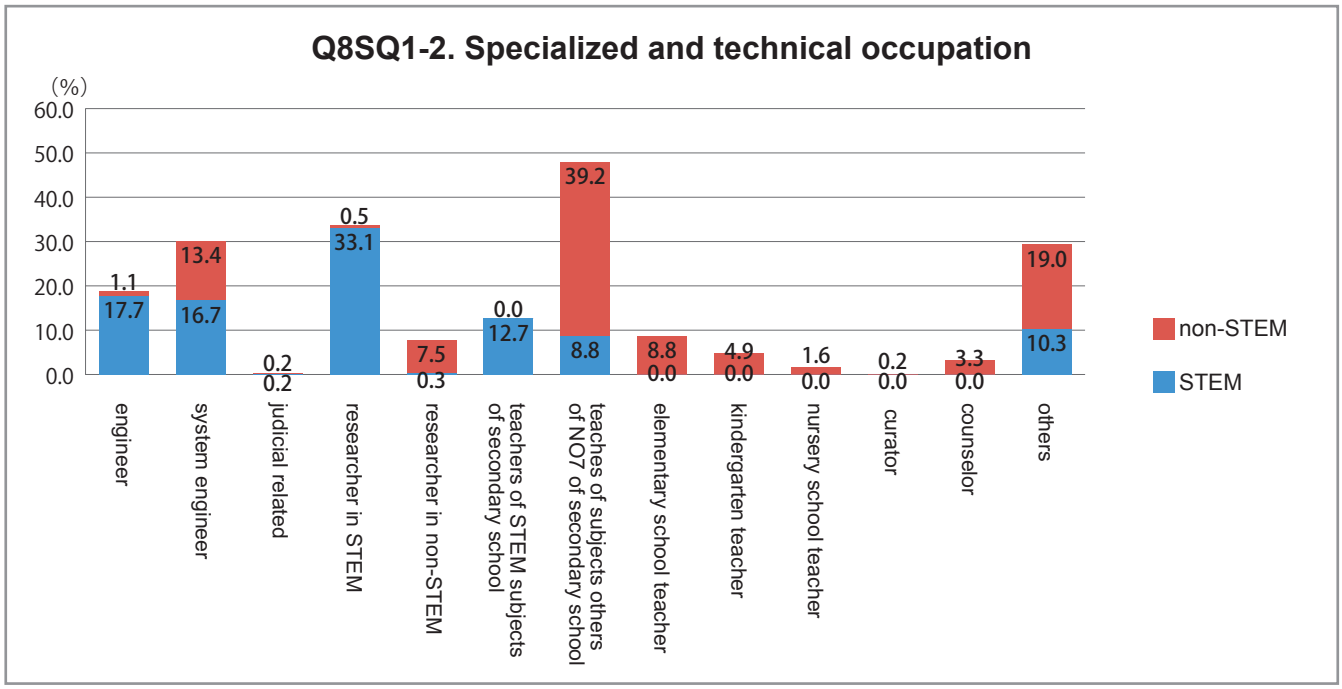
$\chi^2 = 14.20$, $df = 3$, $p < .05$

Employment situation after Graduation showed significant difference, and there were more graduates, 6.2% more, who worked full time in STEM than non-STEM. There were more graduates, 4.4% more who worked part time in non-STEM than in STEM. There were more male teachers who did academic and career counseling in both STEM and non-STEM.

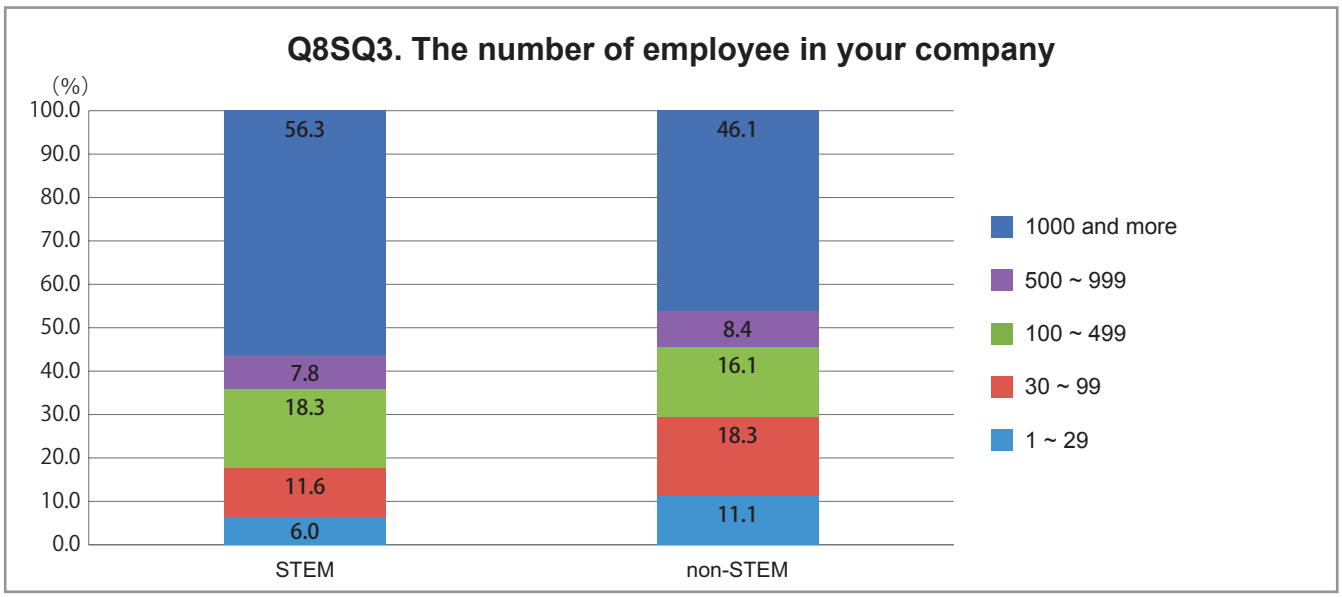


$\chi^2 = 179.2$, $df = 5$, $p < .001$

There was a significant difference in job category. In STEM, "specialized and technical occupation" occupied more than 0% and it was the highest figure. In non-STEM, "office-work" exceeded 24% than in STEM.



Among the "specialized and technical occupation", for mothers who graduates STEM, there are a lot of researchers and then engineers follow. For non-STEM, teaches for non-STEM for middle and high schools resulted the most.

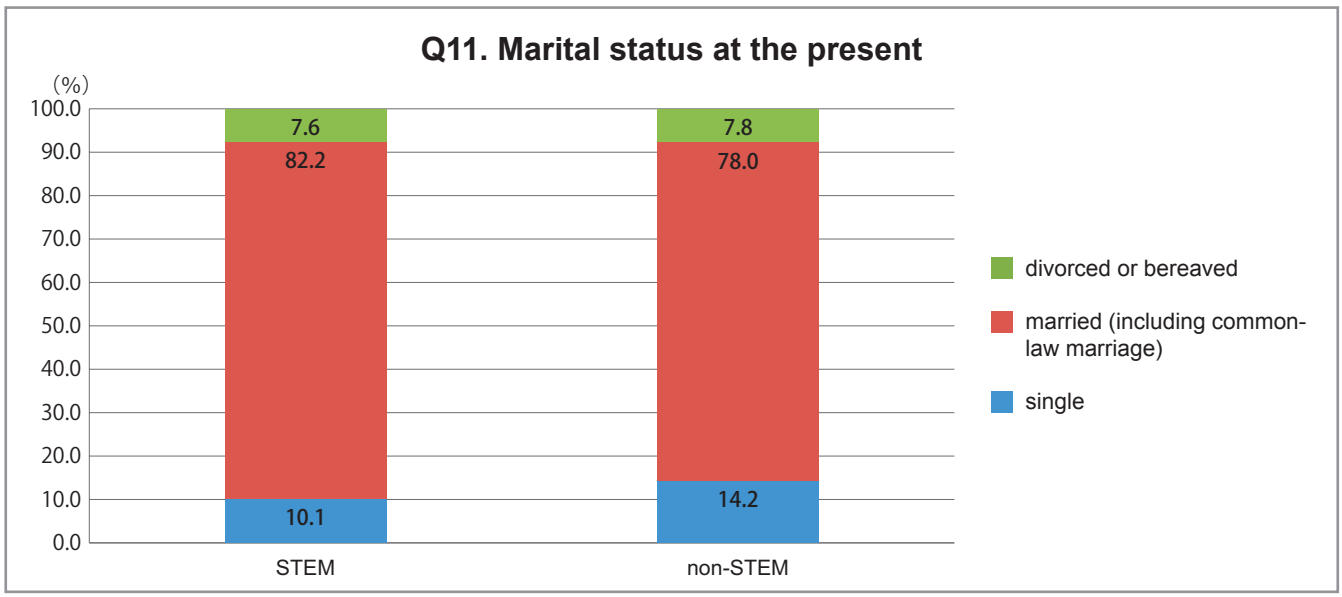


$\chi^2 = 36.0$, $df = 4$, $p < .001$

There is a significant difference in the number of employees among the companies that the graduates started working for after graduation. For both STEM and non-STEM, the highest ratio resulted in the companies that hired more than 1000 people and the ratio of that in STEM exceeds that in non-STEM by 10.2%. The second highest ratio for STEM for companies of scale of 100 ~ 499people, whereas for non-STEM, it is for companies of scale of 30 ~ 99 people.

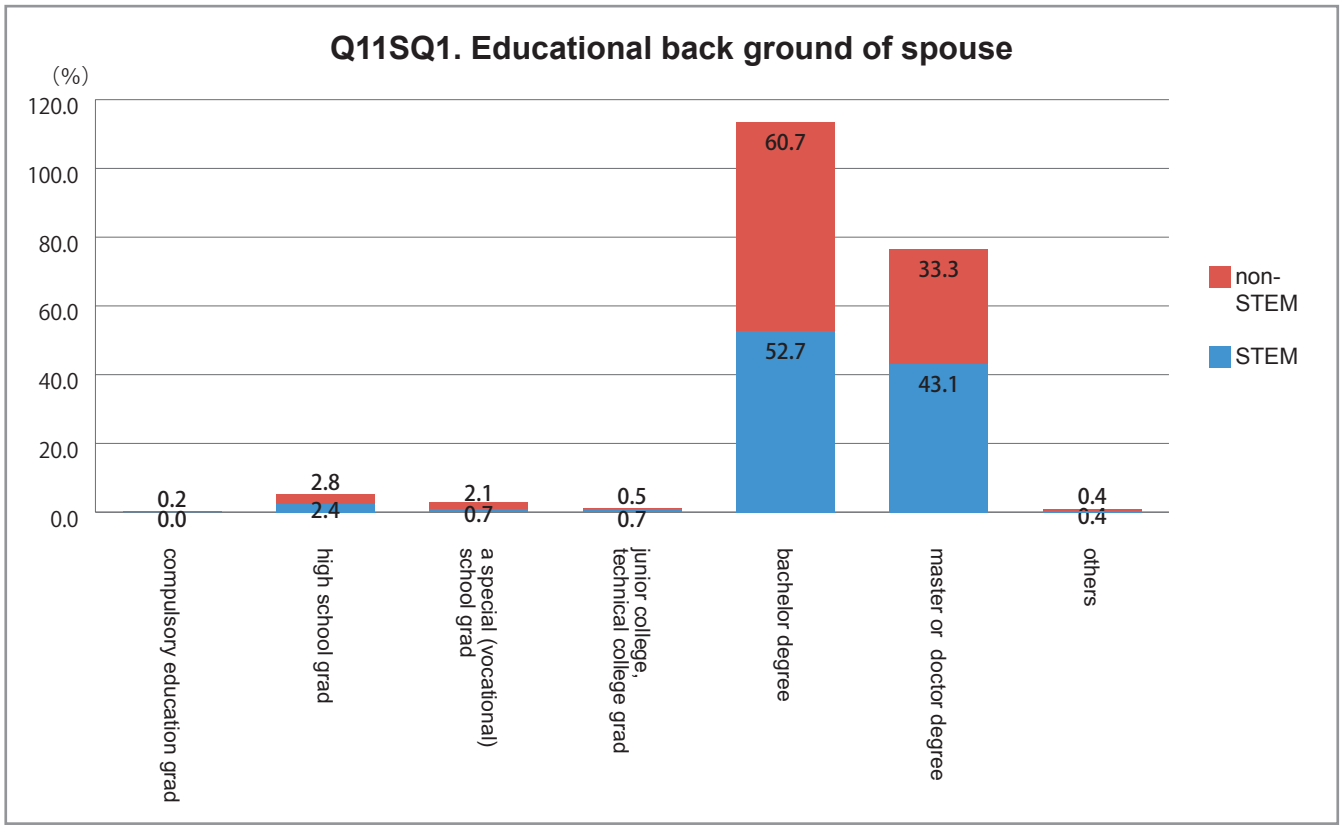
Thus, it can be seen that STEM graduates tend to work for bigger companies. There is not much difference in the years they continued working was 7.5 year to 7.6 year, and there was not much difference.

For the figure on whether they are still working, both STEM and non-STEM graduates work full-time and it resulted in 40% and more. "Not working" and "working part time" follows. Their employment positions at the moment for both STEM and non-STEM are "not in a managerial positions" showing the highest ratio, exceeding 30%, and not showing much difference between STEM and non-STEM. There is not much difference in their income either showing the highest ratio in 4 million yen to 6 million yen per year. Approximately, one fourth of the graduates lived abroad and the years that they lived abroad did not show much difference between STEM and non-STEM.



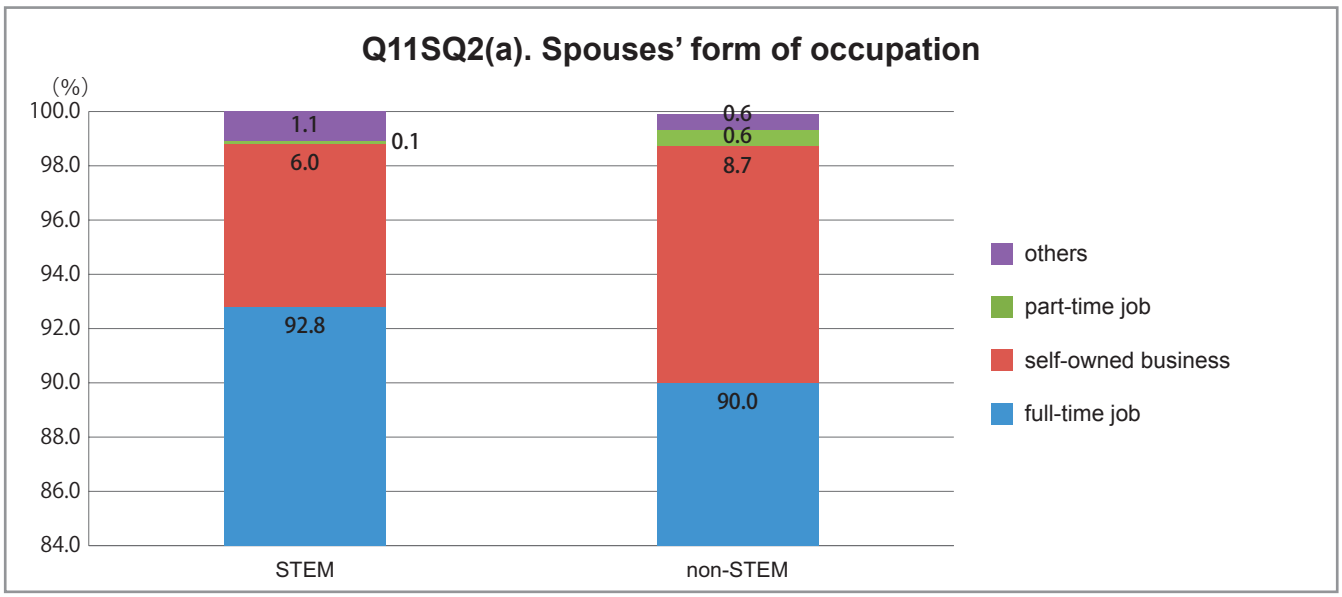
$\chi^2 = 7.6$, $df = 2$, $p < .05$

There is a significant difference in the current marital status and the nuptiality for STEM is higher than non-STEM for 4.4%. “Divorce or bereaved” rates are about the same, but the percentage of single people for non-STEM is 4.1% higher than STEM.



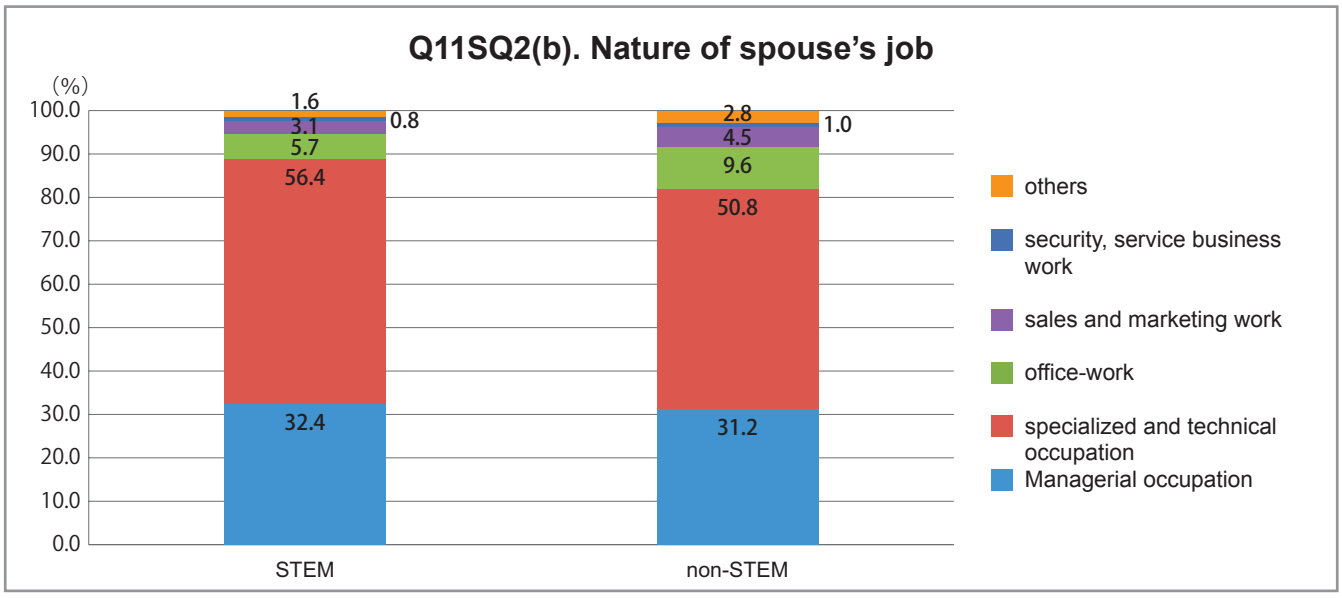
$\chi^2 = 23.3$, $df = 6$, $p < .01$

There is a significant difference in the spouses’ academic back ground. The ratio of spouses being masters degree graduates in STEM is about 10% higher than that of non-STEM.



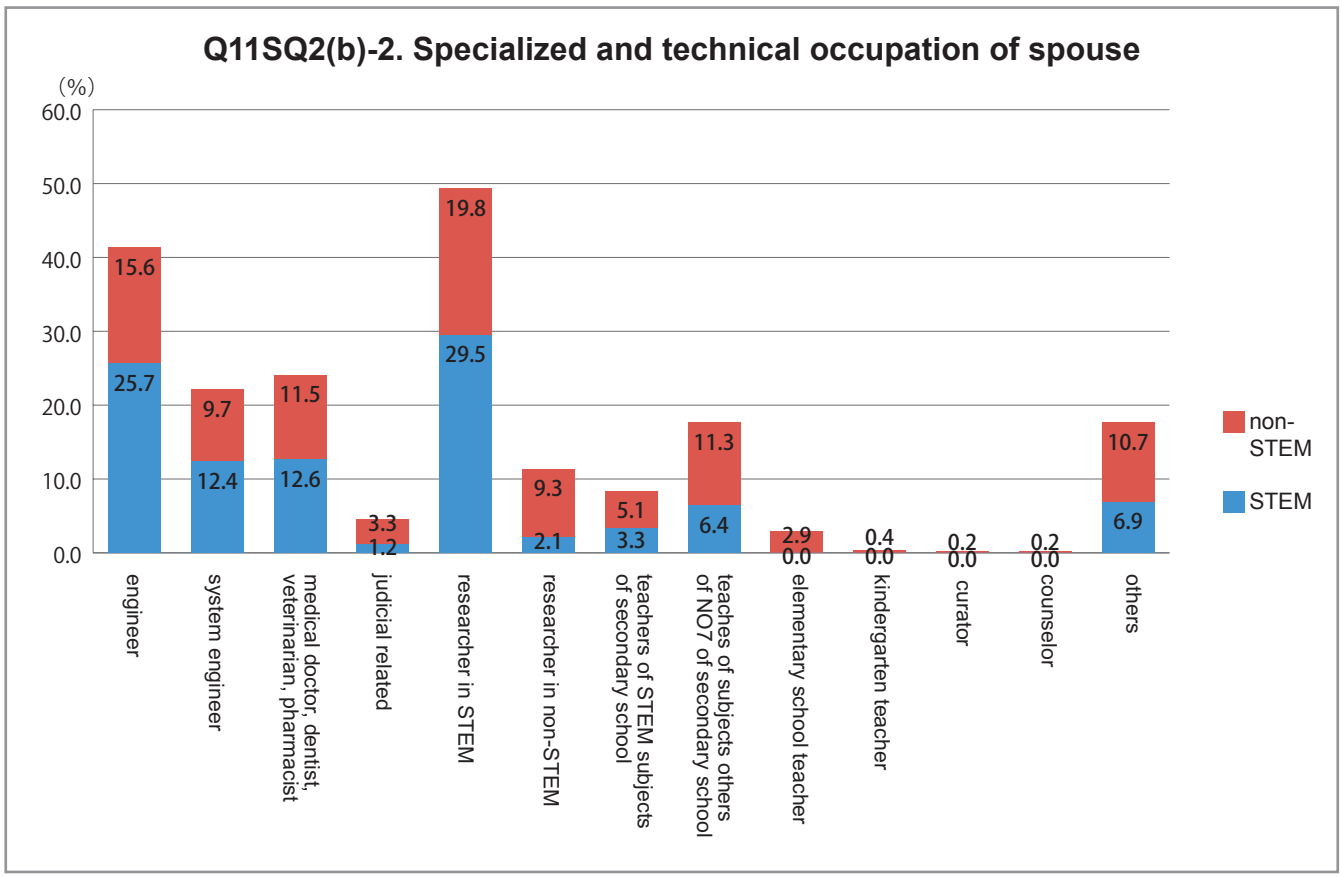
$\chi^2 = 7.9$, $df = 3$, $p < .05$

There is a significant difference in the job of the spouse and there is 2.8% less full time in non-STEM than in STEM. There is 2.8% more self-employment and 0.5% more part-time.



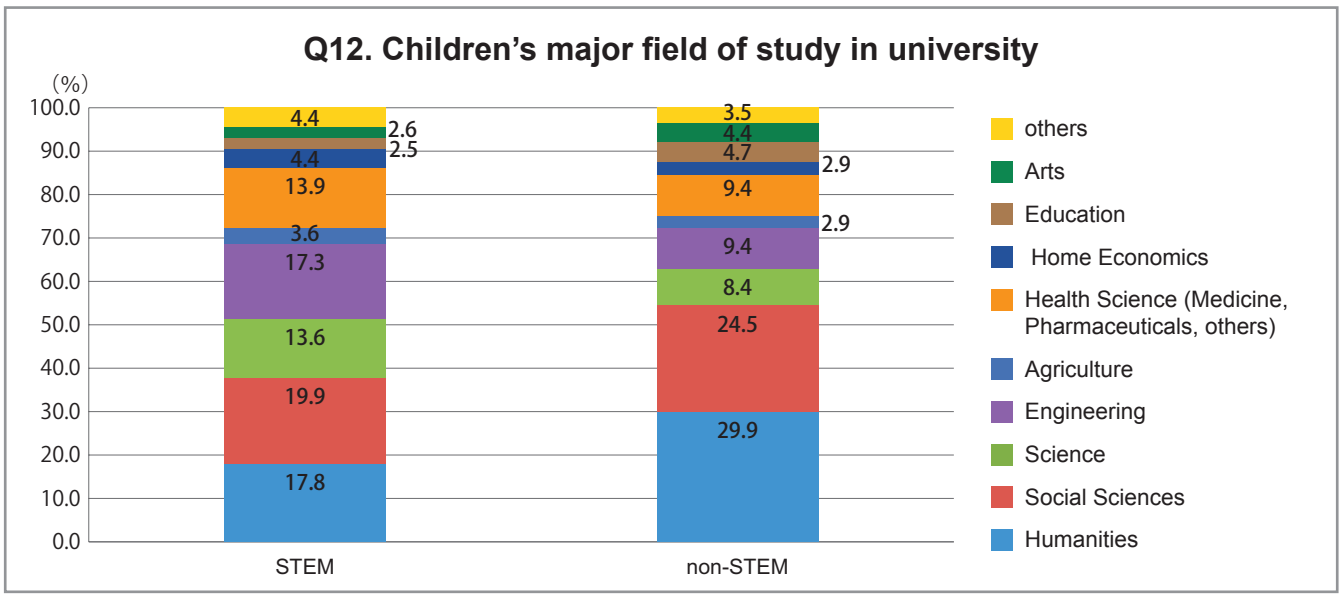
$\chi^2 = 15.7$, $df = 5$, $p < .01$

There is a significant difference in the kind of the spouses' occupations. For the spouse of STEM graduates, there is a 5.6% more percentage in for "specialized and technical occupation". For "office-work", non-STEM exceeds by 3.9%.

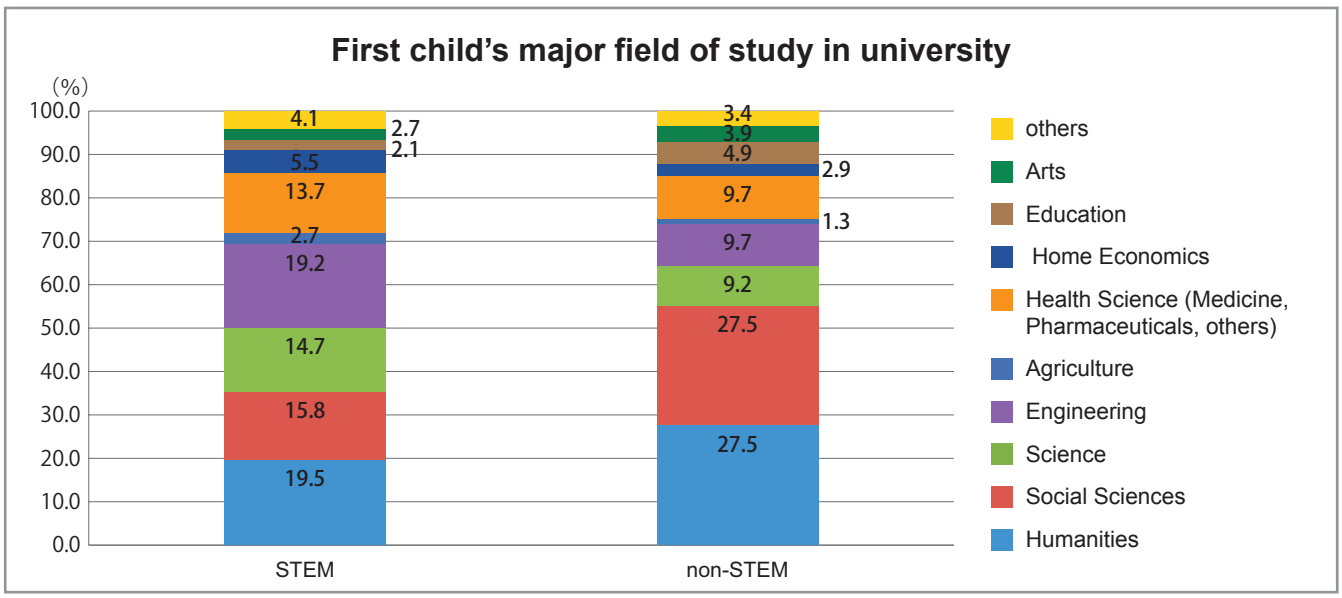


Among the “specialized and technical occupation”, the highest percentage resulted in “researcher in STEM” for the spouses for both STEM and non-STEM, but the percentage for STEM in higher than non-STEM by 9.7%.

The kinds of occupation that follows is “engineer” and the percentage exceed that of non-STEM by 10.1%. STEM exceeds that of non-STEM by a couple of percent in “medical doctor, dentist, veterinarian, pharmacist” and “system engineer”. The kind of occupation that non-STEM exceeds STEM are “researcher in non-STEM” (+7.2%), teacher in primary and secondary education, and “others”. The annual income of the spouse don’t differ among STEM and non-STEM.

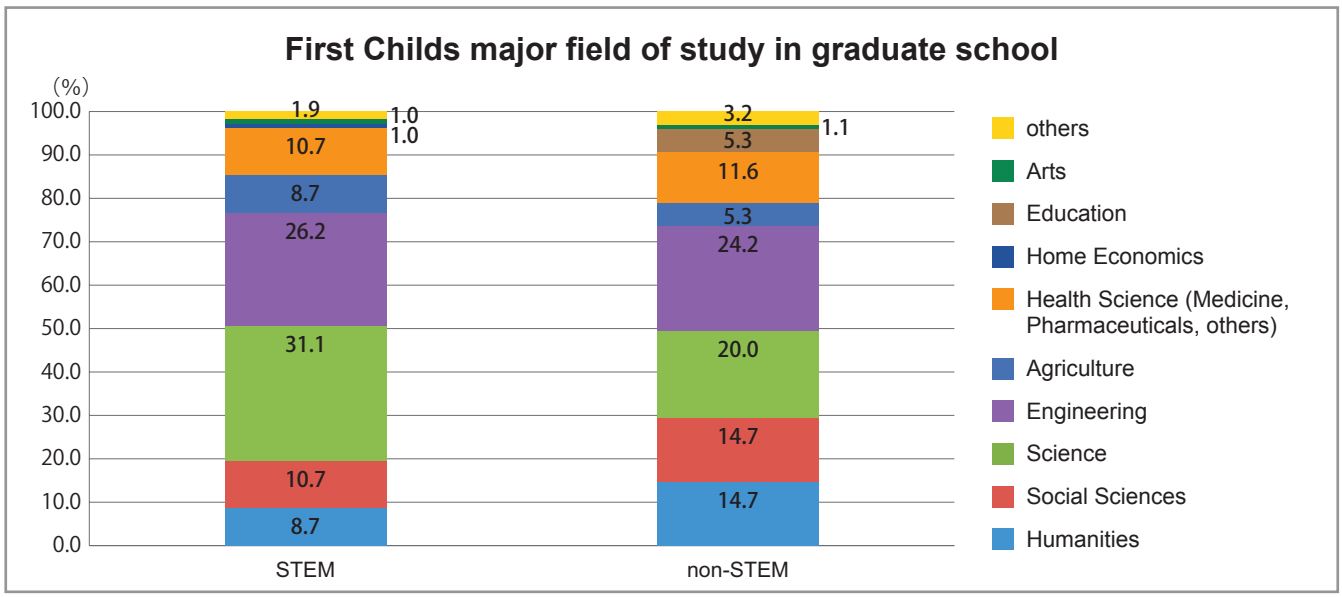


STEM N=612, non-STEMN=766



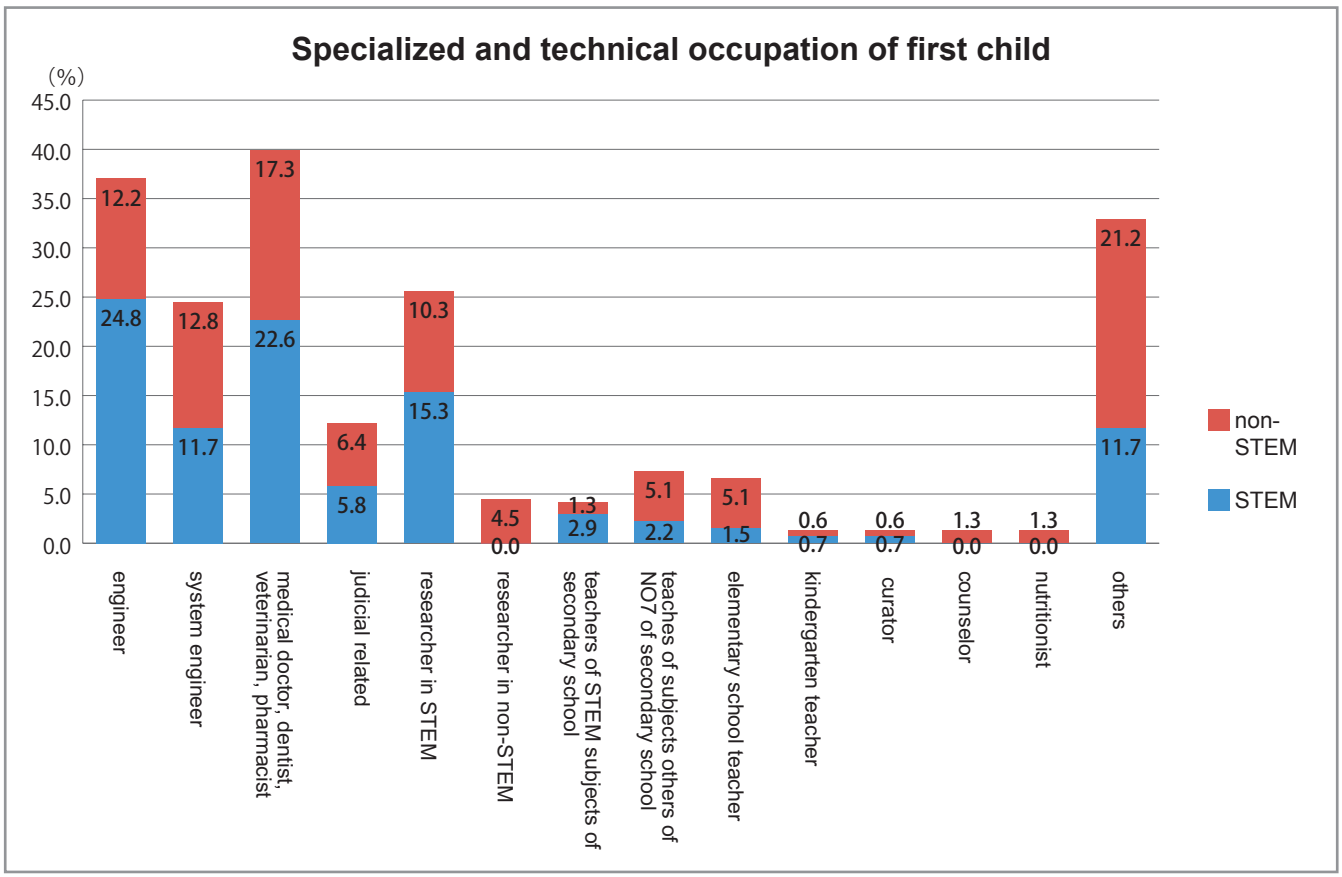
STEM N = 292, non-STEMN = 382 $\chi^2 = 41.4$, $df = 9$, $p < .001$

Difference among STEM and non-STEM in the number of children whether they had children or not could not be seen. In the faculty of the children's university, there was a significant difference among the graduates of STEM and non-STEM. For children of STEM graduates, "social science" resulted highest as 19.9%, followed by "humanities (17.8%)", "engineering (17.3%) and so on. For non-STEM, humanities resulted the highest as " 29.9%, followed by "social science (24.5%)". These two make up half of the number. Next is followed by both "engineering" and "health science (medicine, pharmaceuticals, others)" by 9.4%. Among children with STEM graduate mother, children who proceeded to STEM faculty (science, engineering, agriculture, and health science) resulted in 48.4% whereas 30.0% among children with non-STEM graduate mother. The faculties which resulted in a higher ration of children of STEM mothers than those of non-STEM mother were faculty of science, engineering, agriculture, health science, home economics, and others. The same tendency was seen in the first born child.

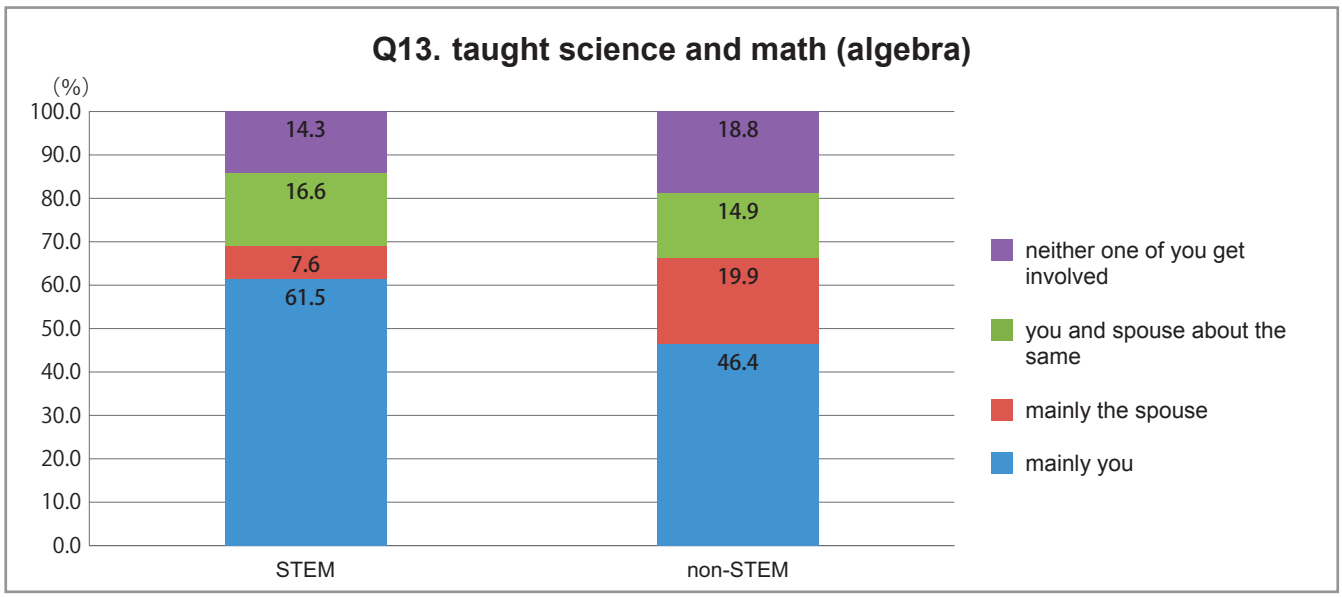


STEM N = 103, non-STEMN = 95

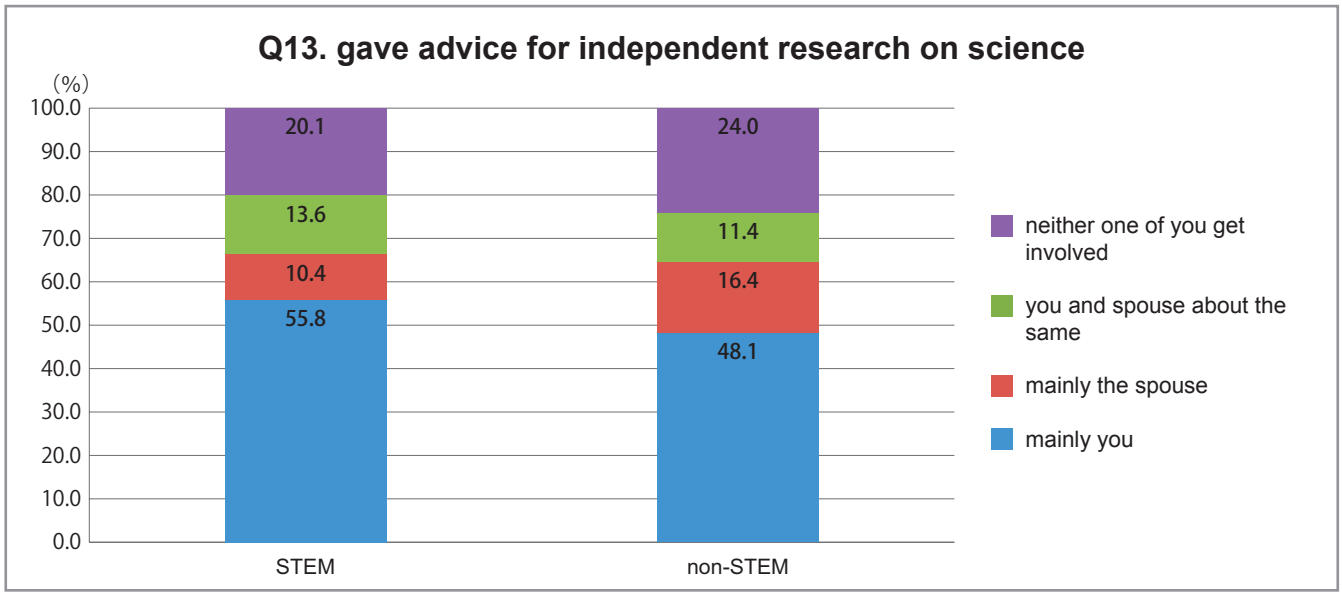
There was not much difference among the kinds of major that the first born children proceeded in masters' course between STEM and non-STEM. However percentage of the first born children of STEM mothers who proceeded to masters' course was 35.3%, 10.4% higher than that of the percentage of first born of the non-STEM mothers (24.9%). The tendency to go to STEM for children of STEM graduates was 76.7% and for non-STEM, it was 61.1%, so difference was 15.6%.



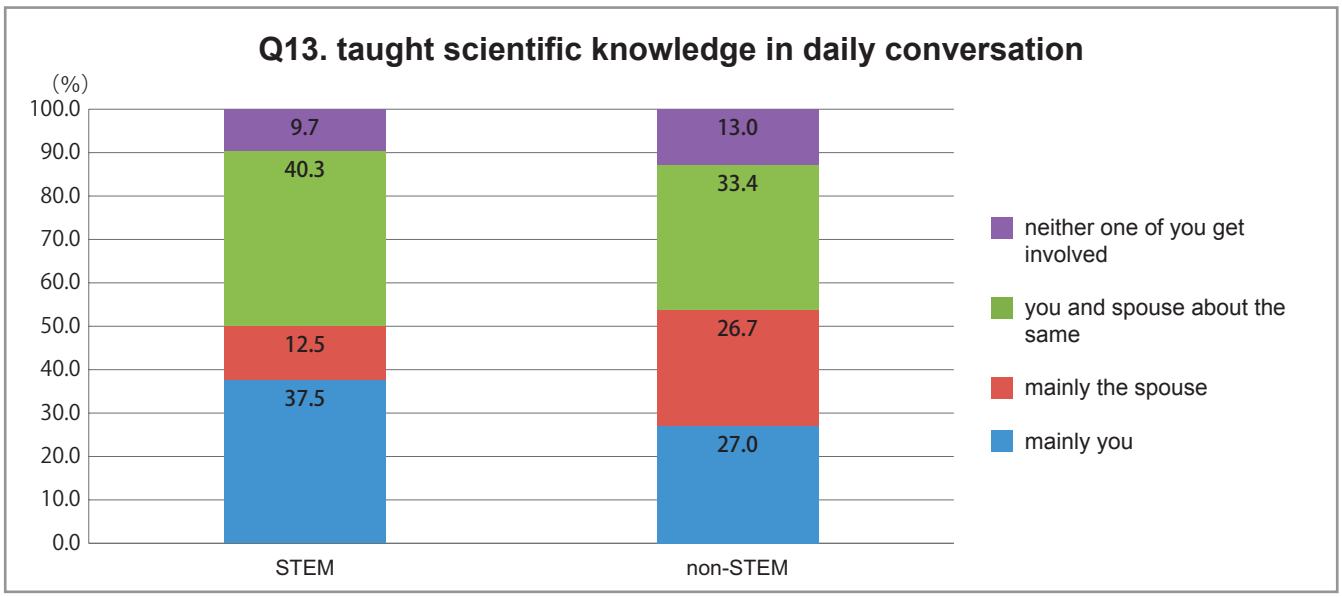
There was no difference among the kinds of occupation between STEM and non-STE. Among “specialized and technical occupation”, the highest percentage of first born children of the STEM graduates was “engineer”, followed by medical doctor, dentist, veterinarian, pharmacist. For children of non-STEM graduates, the highest was “others”, and “medical doctor, dentist, veterinarian, pharmacist” followed. STEM was higher by 12.6% for “engineer” and by 5.3% for “medical doctor, dentist, veterinarian, pharmacist”. The kind of occupation which resulted in a higher percentage for non-STEM was, the same as the spouses’ occupation, “researcher in non-STEM (+7.2%)”, teacher in primary and secondary education, and others. Compared to the father’s occupation, the percentage of “medical doctor, dentist, veterinarian, pharmacist ” doubled for STEM and X1.5 for non-STEM. ““researcher in STEM” decreased in both groups by half.



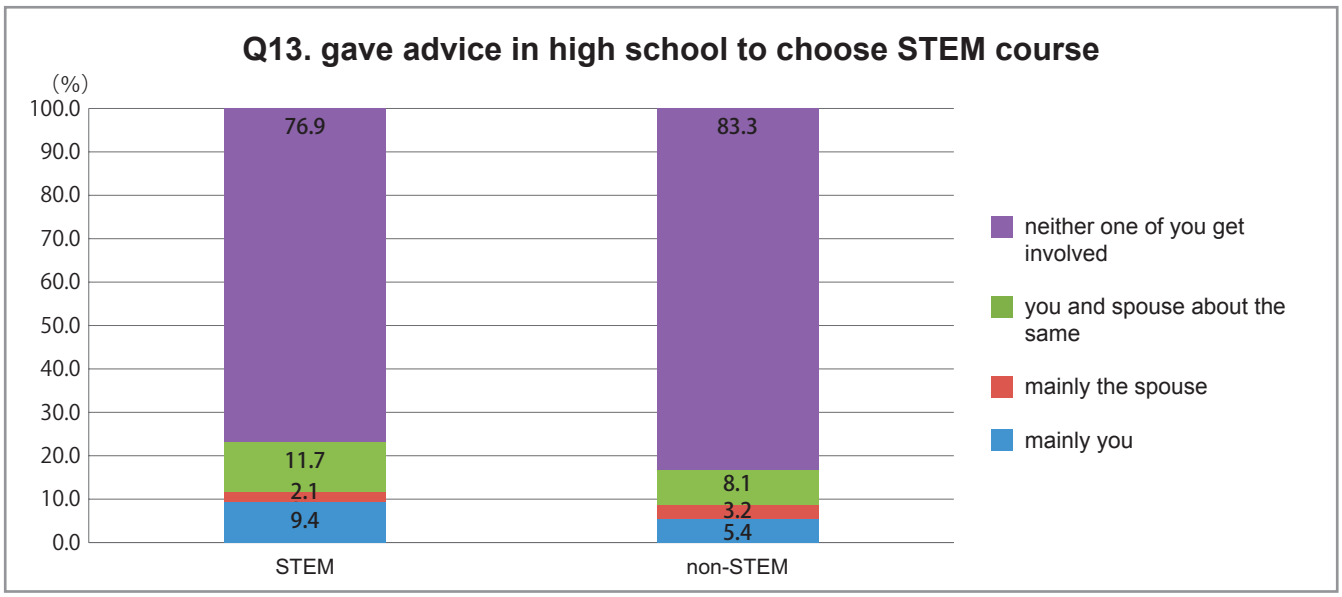
STEM N = 553, non-STEMN = 670, $\chi^2 = 49.0$, $df = 3$, $p < .001$



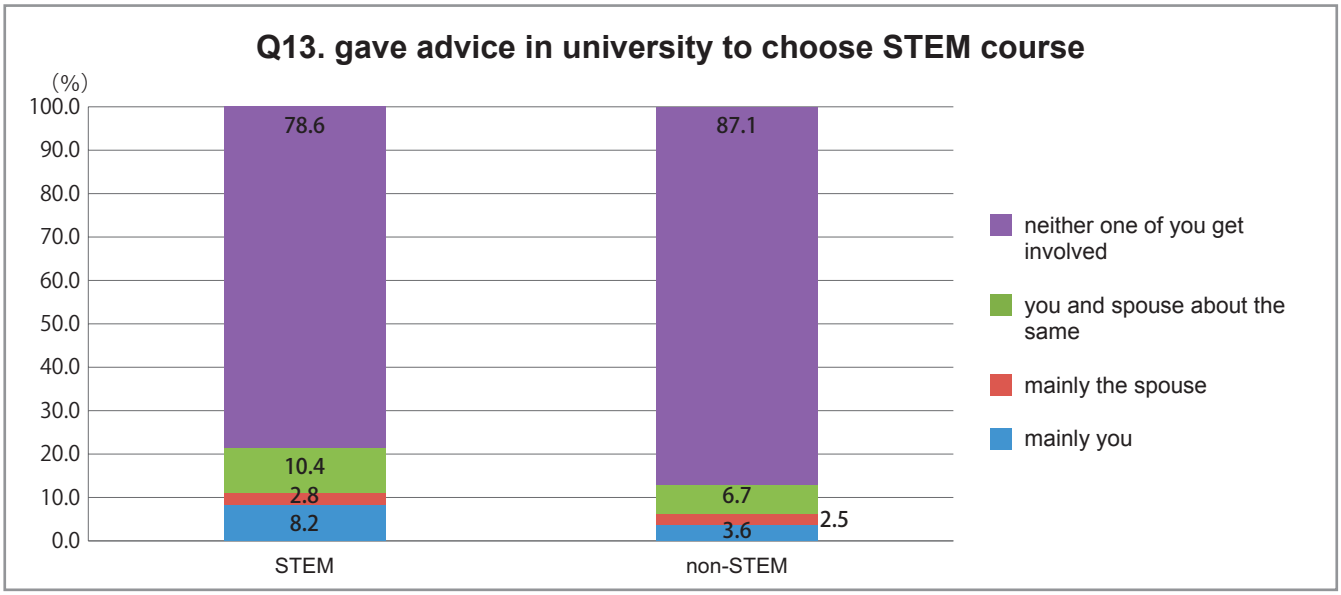
STEM N = 536, non-STEMN = 657, $\chi^2 = 14.3$, $df = 3$, $p < .01$



STEM N = 558, non-STEMN = 671, $\chi^2 = 47.5$, $df = 3$, $p < .001$

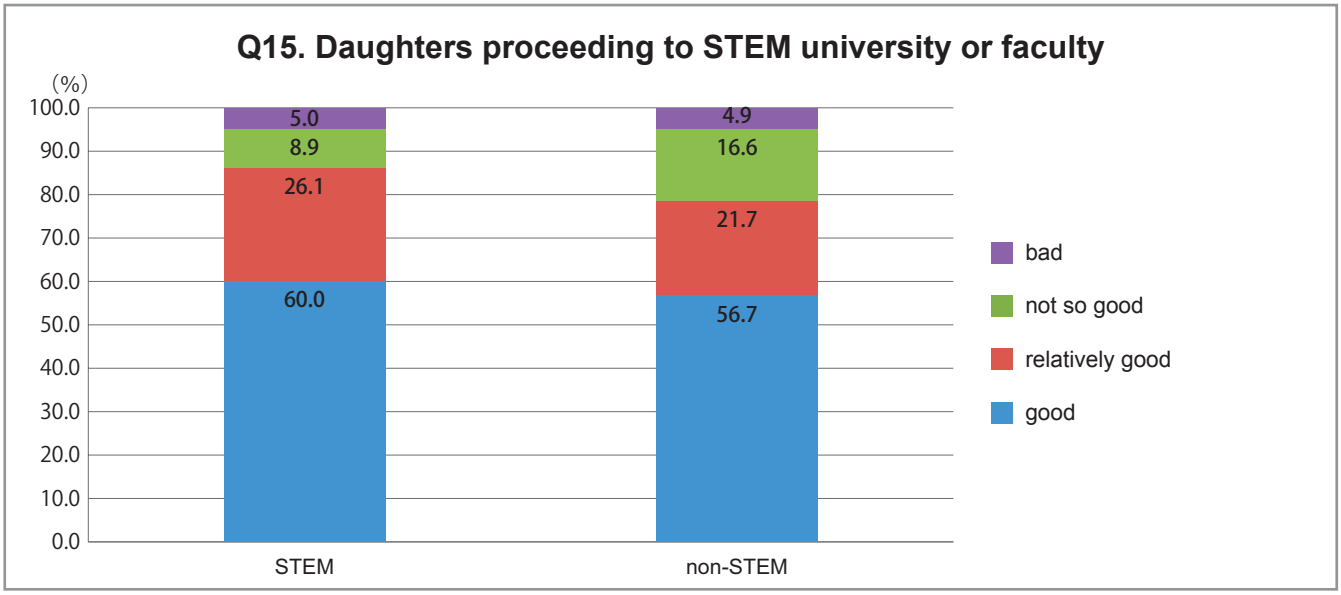


STEM N = 437, non-STEMN = 533, $\chi^2 = 10.8$, $df = 3$, $p < .05$



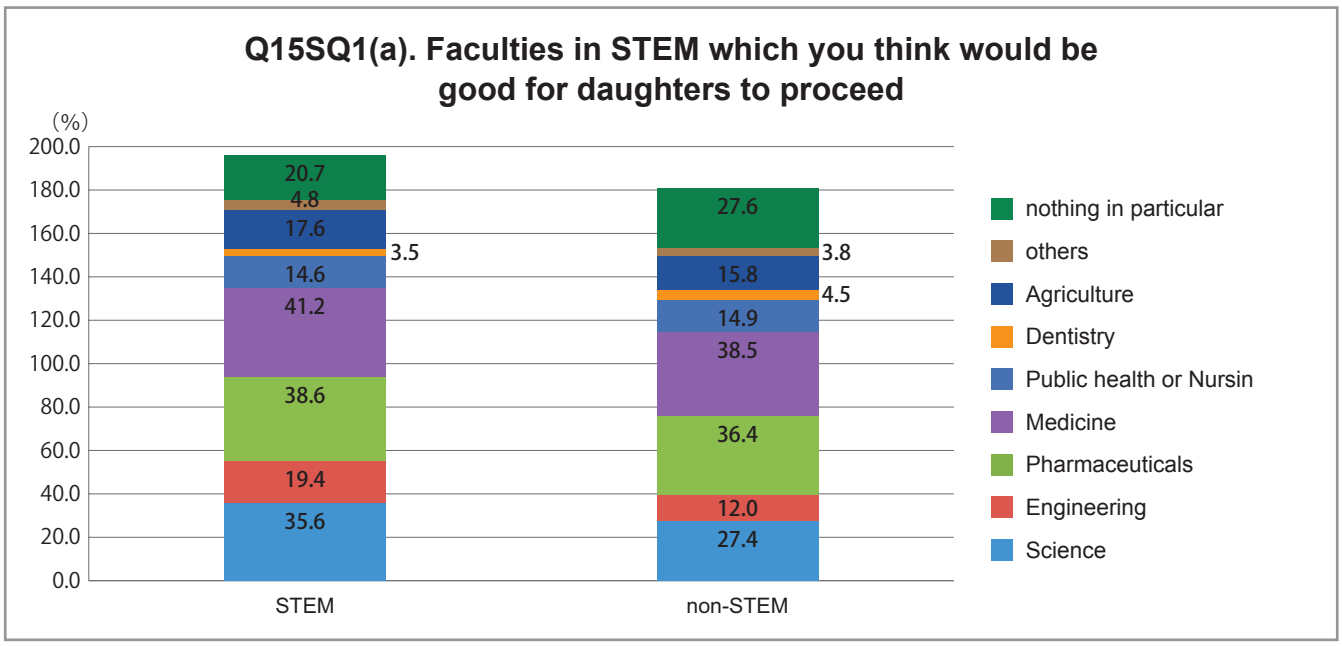
STEM N = 425, non-STEMN = 521, χ^2 = 14.5, *df* =3, p < .01

In all the items concering the question 13, "how much were you and your spouse involved in your child's education?" , the mother's (graduate) involvement outnumbered that of the father. In cross tabulation of STEM and no-STEM graduate, qusetions toward first born which showed significant defeerence were the following 6 items. "taught science and math (algebra) (STEM 61.5%, non-STEM 46.4%)," "gave advice for independent research on science (STEM55.8%, non-STEM48.1%)," "taught scientific knowledge in daily conversation (STEM 37.5%, non-STEM 27.0%)," "gave advice in high school to choose non-STEM course (STEM4.6%, non-STEM8.2%)," "gave advice in high school to choose STEM course (STEM9.4%, non-STEM5.4%)," "gave advice in high school to choose STEM course (STEM8.2%,non-STEM3.6%)." It was characteristic they were items where knowledge for STEM was necessary.

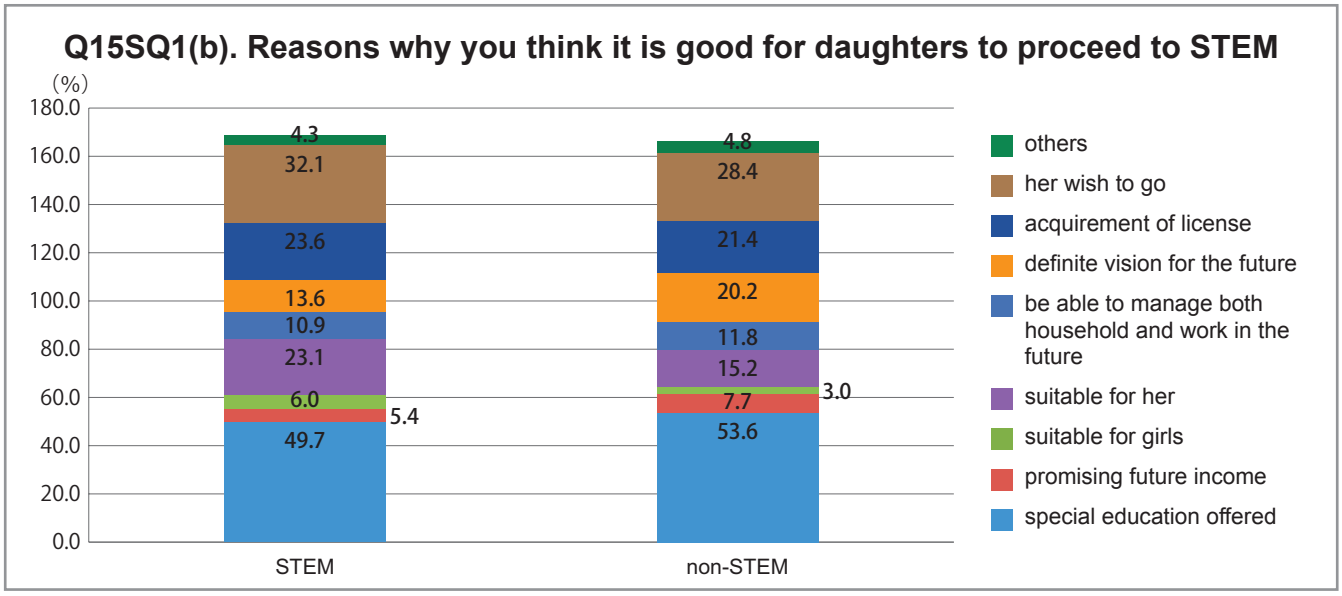


STEM N = 440, non-STEMN = 571, χ^2 = 13.8, *df* = 3, p < .01

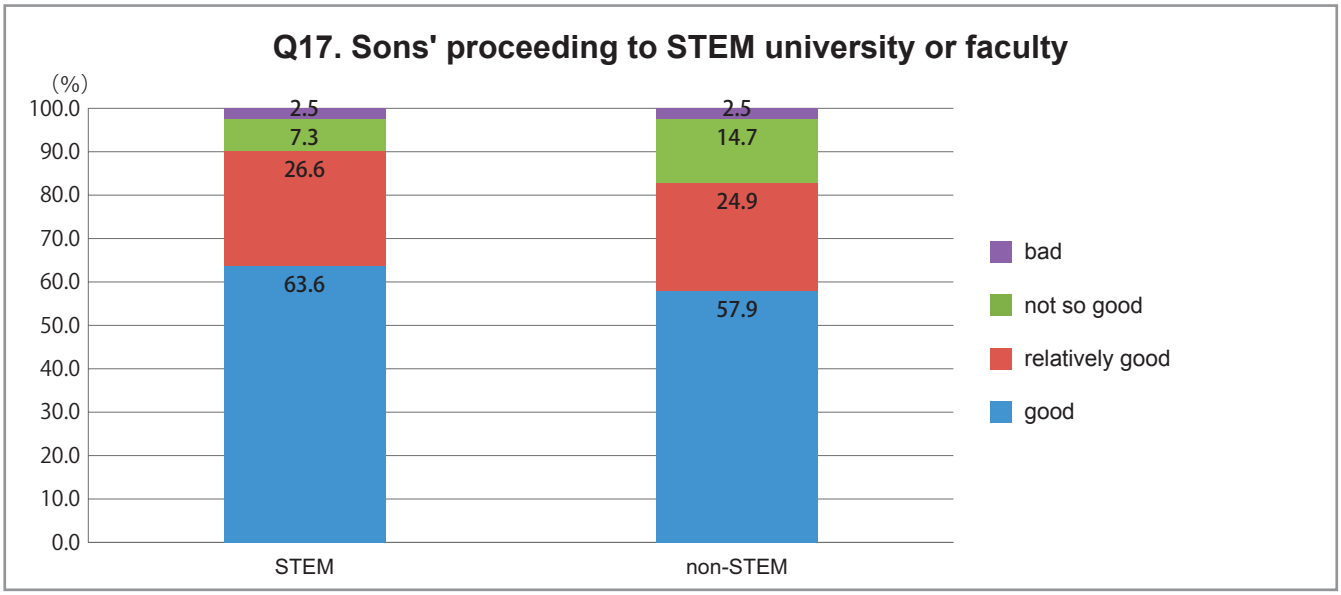
About female proceeding to STEM, there was a significant difference among some items depending on whether the mother (graduate) was STEM or non-STEM. The graduate who said "good "or "relatively good" about "female proceeding to STEM university or faculty" was 86.1% for STEM,78.4% for non-STEM. STEM exceeded non-STEM by 7.7%.



The faculty with the highest percentage which both STEM and non-STEM graduates wish their dughters to attend was pharmaceuticals and next followed medicine. For Science, the percentage of STEMwas 8.2% higher than non-STEM and for engineering, it was 7.4% higher. In comparison to the “nothing in particular”exceeded in non-STEM by STEM by 6.9%.

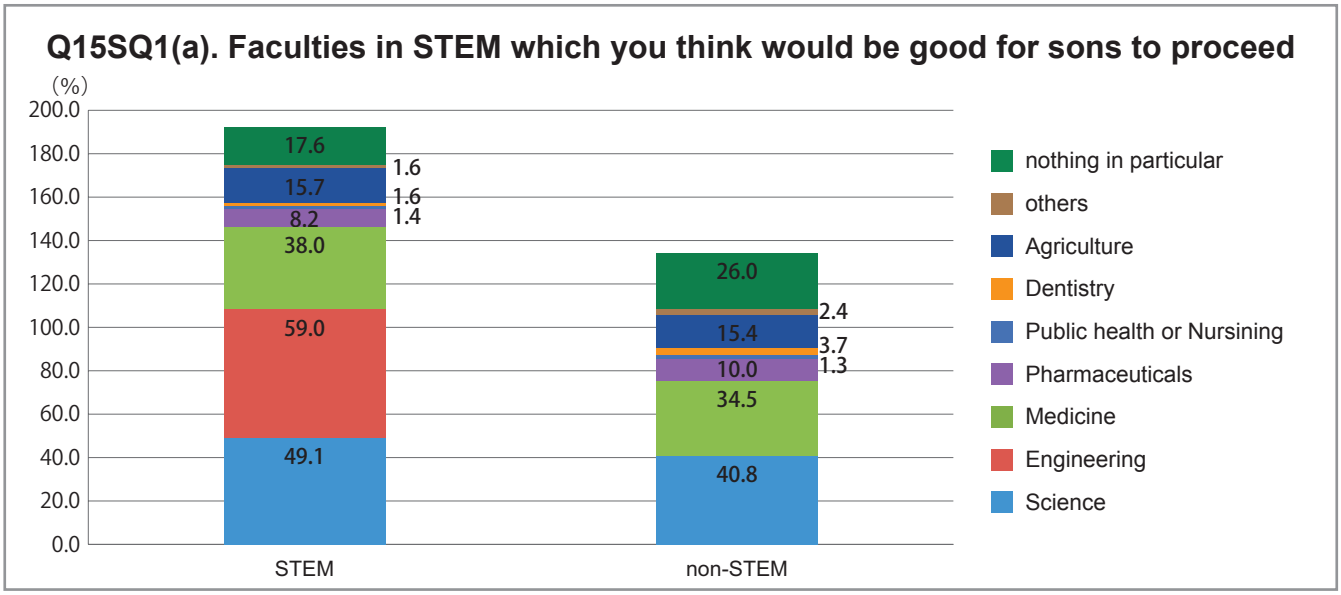


In bothe Stem and non-STEM, “special education offered”was the top reason. There appeared a difference of 7.9% in the figure for “suitable for her” betweeen STEM and non-STEM. For non-STEM mothers, the fourth bigest percentage was “definite vision for the future (non-STEM 20.2%)” following “acquirement of license”. However for STEM mothers, it was not so high (STEM13.6%). The target for “definite vision for the future” for non-STEM graduates, there is a possibility that it could be “medicine” or “pharmaceuticals”.

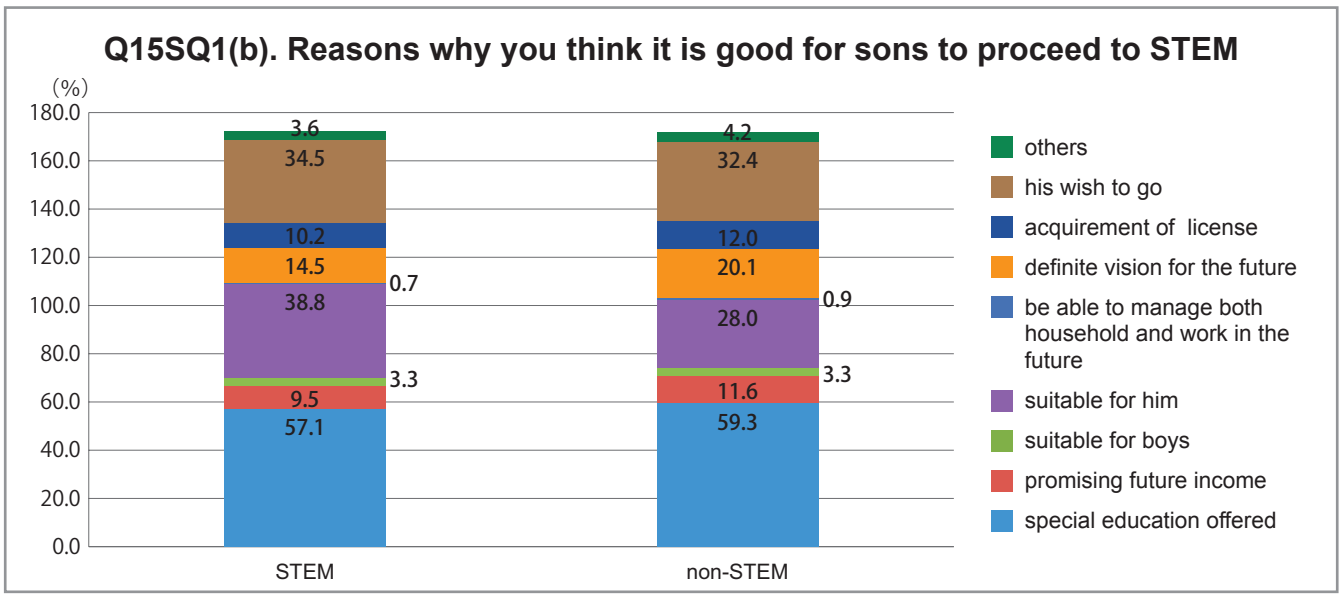


$\chi^2 = 14.2,\ df = 3,\ p < .01$

About male proceeding to STEM, STEM graduate who said “good ”or ”relatively good” exceeded non-STEM by 7.4% (STEM 90.2%, non-STEM 82.8%). Both for their dauthers and sons, STEM mothers wished more to proceed to STEM facilty.



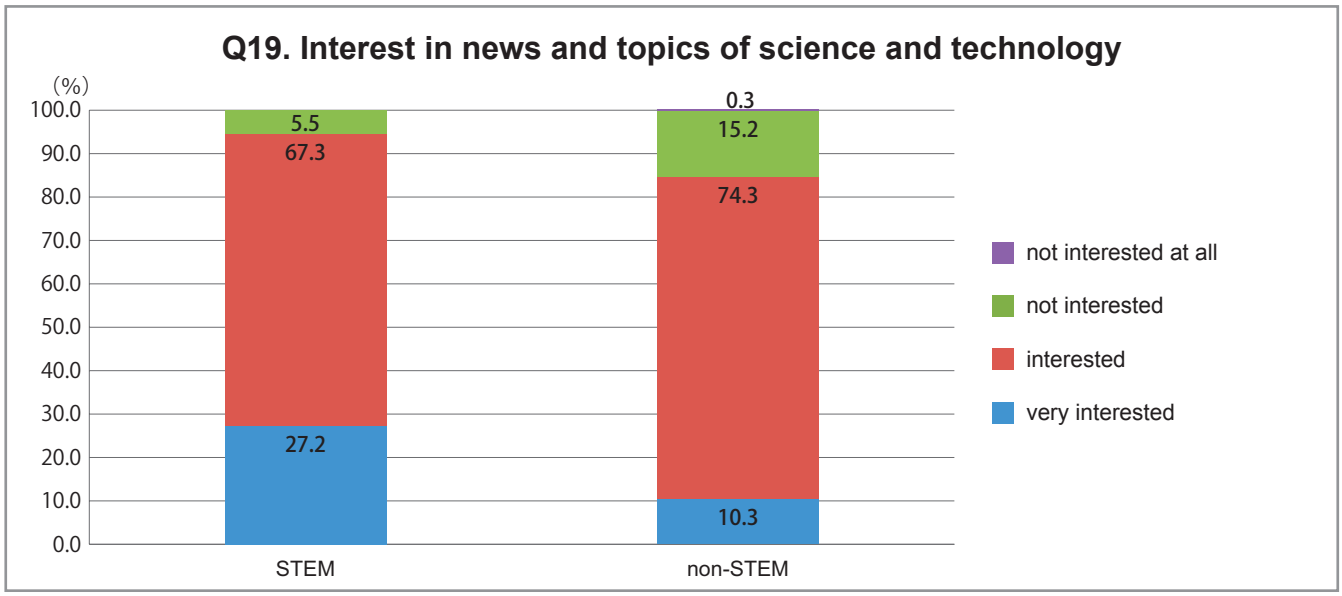
The faculties (choose 3) that graduates wish their sons to proceed wereenginerring (STEM59.4%, non-STEM48.2%), science (STEM49.1% ,non-STEM40.8%), medicine (STEM38.0%, non-STEM34.5%). There is no difference in oreder, but there are differences in the percentages. And as the same as for their daughters, the difference appeared in the percentage for the figure of “nothing in particular.” (STEM17.6%, non-STEM26%)



The biggest reasons why son should proceeded to STEM was “special education offered” (STEM 57.1%, non-STEM 59.3%) for both STEM and non-STEM mothers.

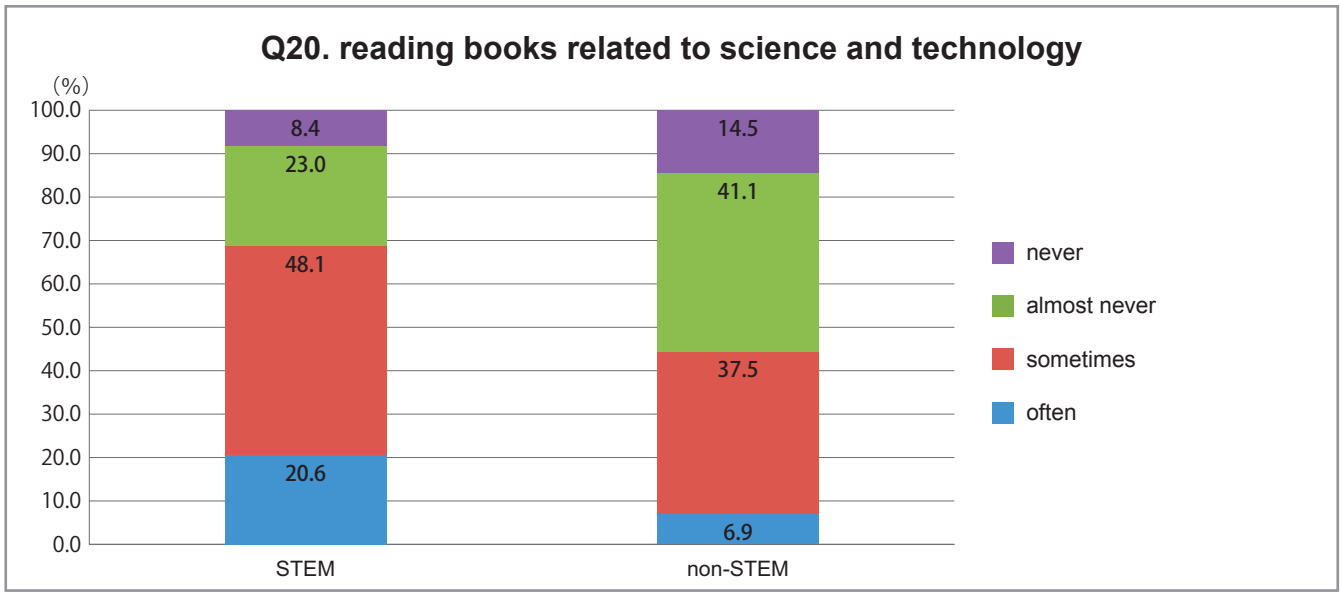
For STEM, the nest reason was “suitable for him (38.8%)” whereas fo non-STEM, it wa a lower percentage of 28.0%. was 34.5% for STEM and 32.4% for non-STEM both showing a high percentage. For “acquirement of license”, STEM was 14.5% and non-STEM was 20.1%. As the same as for daughters, non-STEM showed higher percentage. The reason that the graduates chose for why “sons should not proceed to STEM ”was mostly because “not suitable for him” or “his wish not to go”. T “His wish not to go” was higher in non-STEM, just like daughters. The male figure that the graduates woshed their son become sis not show much difference between STEM and non-STEM

2-4. About science and technology

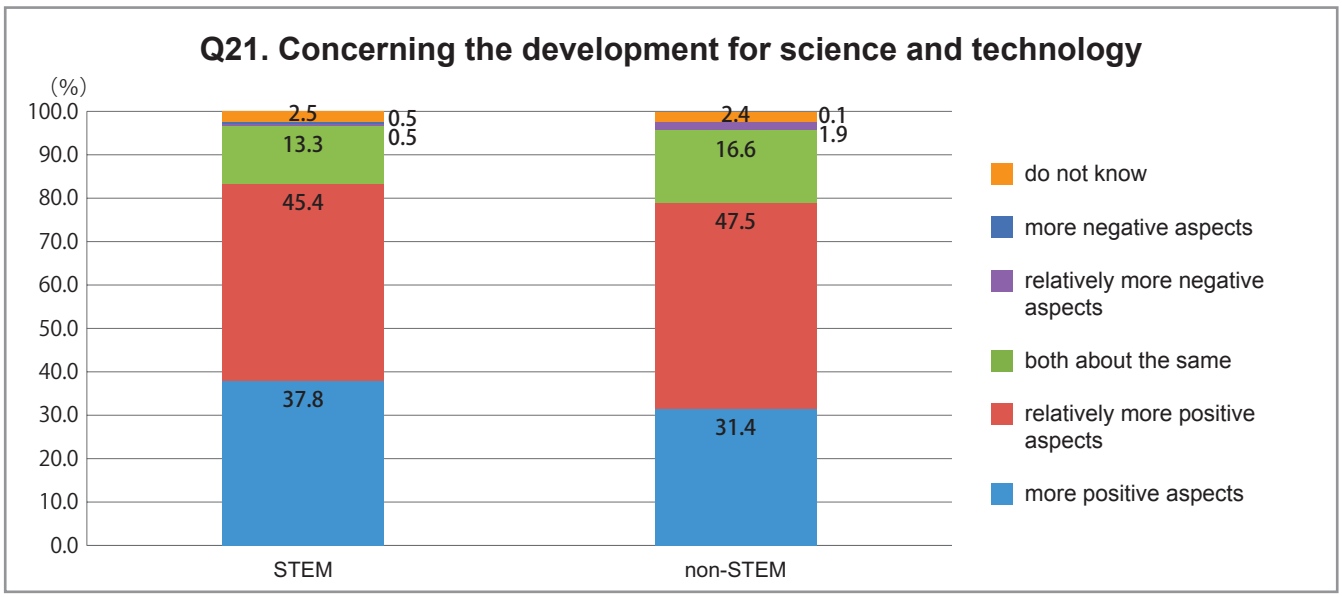


$\chi^2 = 123.0,\ df = 3,\ p < .001$

There was a significant difference among STEM and non-STEM. The sum of the percentage of "very interested (STEM27.2%, non-STEM10.3%)" and "interested (STEM 67.3%, non-STEM 74.3%)" was 10.0% more in STEM than in no-STEM.

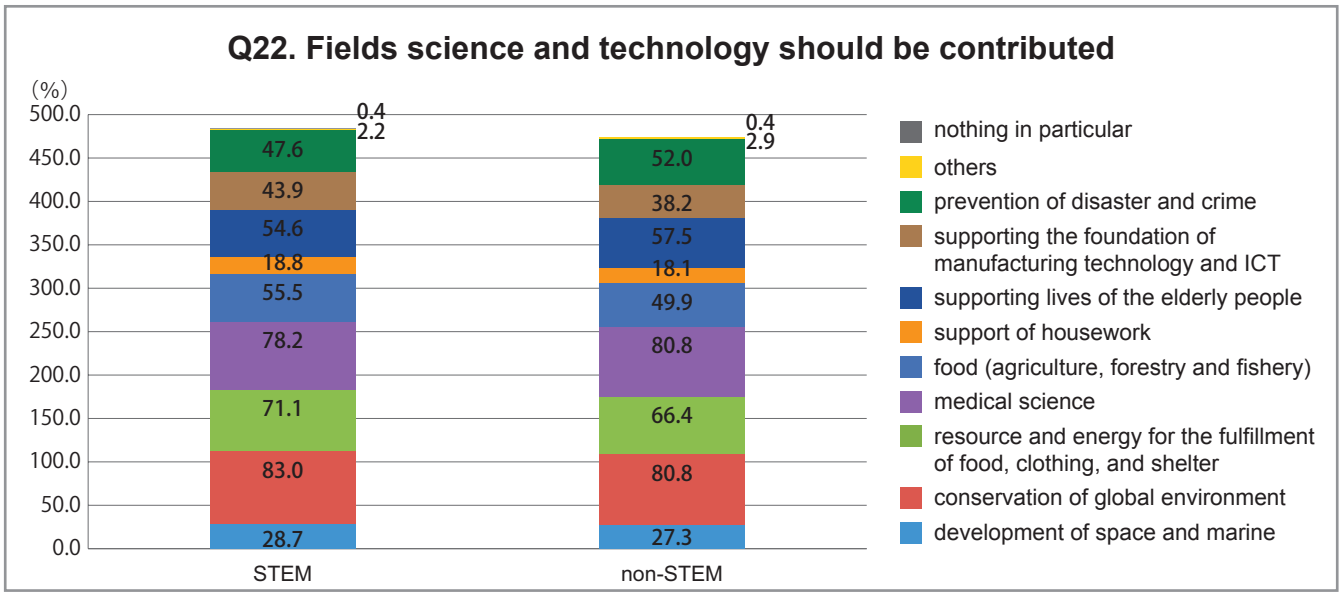


For replies about "whether you had experience on the following within the past 2-3 years", in all of the questions besides "going to science museums or natural history museums", there was a significant difference between. STEM and non-STEM. There were more percentage for "going to art museums" or "going to concerts" in non-STEM, for "reading books related to science and technology", "going to lectures of scientists or engineers" and "attending Science Café", STEM had higher percentage.



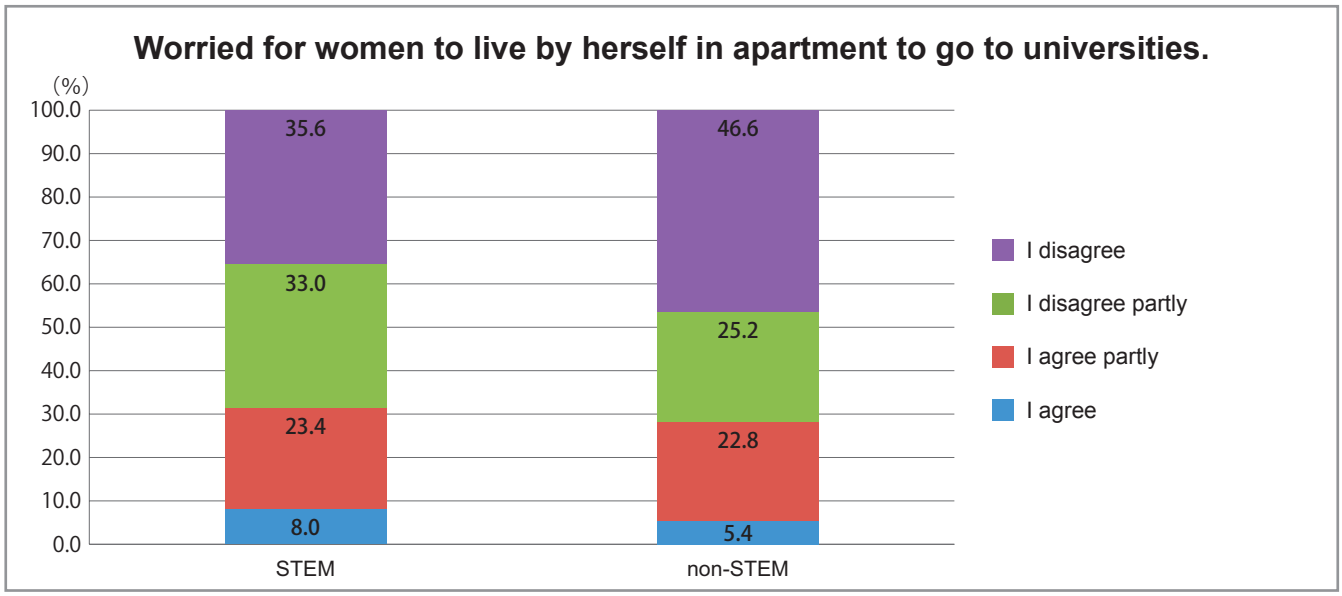
$\chi^2 = 19.8,\ df = 5,\ p < .01$

Concerning the development for science and technology, there was a significant difference among STEM and non-STEM. STEM graduates who believe that there are "more positive aspects" exceeded that of non-STEM graduates by 6.4%. "relatively more positive aspects" put together with that figure makes 83.2% for STEM and 78.9% for non-STEM.



Significant difference was not seen in the area where science technology should be contributed between STEM and non-STEM.

2-5. The way women should live



There was a significant difference in non-STEM and STEM within the idea of female student's career choices in following 5 items for "Women are suited to non-STEM" ($\chi^2 = 15.5$, $df = 3$, $p < .01$), "Women are suited to STEM" ($\chi^2 = 21.3$, $df = 3$, $p < .001$), "worried for women to live by herself in apartment to go to universities" ($\chi^2 = 29.0$, $df = 3$, $p < .001$), "environment is not prepared for women to proceed to STEM faculty" ($\chi^2 = 18.1$, $df = 3$, $p < .001$) "meaningless for women to proceed master degree" ($\chi^2 = 9.9$, $df = 3$, $p < .05$). For example, in "worried for women to live by herself in apartment to go to universities", STEM graduates were more worried about students living by herself in colledge that non-STEM graduates. Concerning the ides about women continue working, there was not a significant difference between STEM and non-STEM. The graduates who thought that "Women should continue holding occupation even if she has children" held a majority of 60%, and "others" followed that.

In terms of the most appropriate way for women to participate in economy and politics, the most replay was for "providing an environment for women to continue working whole raising a child", followed by "the reform of consciousness of women towards society" and there was not much difference among STEM and non-STEM in answerers.

Afterward

First of all, we would like to express our greatest appreciation and gratitude for the fact that we were able to obtain precious questionnaire data through the kind contribution of the Research Committee on Graduates of Ochanomizu University chaired by vice president of Ochanomizu University Dr. Keiko Takano and the graduates enrolled in the OG database of Ochanomizu University when we fulfilled the research of JSPS KAKENHI Grant Number 25282040.

We were able to obtain a high response rate despite the short period of time due to the respectable school spirt of the graduates who were more than willing to cooperate to their alma mater and also due to the warm consideration by the members of the Research committee on Graduates.

This report is only about a simple tabulation and cross tabulation, but further analyzation of this data, we hope, becomes a possible precious source to contribute to providing more STEM women which are in need and also women who are able to obtain a passion with leadership.

Our apologies to all the inconvenience concerning mailing of the questionnaire and response to those in related. We would like to reflect all your precious opinions on our further research.

Also, after collecting this we conducted further additional questionnaire to those who were possible timewise and were willing to reply for “Women’s course selection” in “Questionnaire on women’s course selection continuing education, and leadership”. We would like thank form the bottom of our hearts to those who came all the way to participate for the interviews and also to the staffs of the Library of Ochanomizu University for providing us a place for the interviews. The results of these will be used to reinforce further proof the analysis and result of the questionnaire.

We would like to continue our analysis and further expand our knowledge through our web-site, paper, and presentation in academic society. We would appreciate your further support.

Thank you again for your kind cooperation and we wish for all your health and happiness.

January, 2016

Study Group for Women’s Course Selection

Yuko Hayashi PhD, Professor, Yamaguchi University, Japan
Hideko Kunii PhD, Professor, Shibaura Institute of Technology, Japan
Ginko Kawano, Professor, Yamagata University, Japan

Appendix 1　Women's course selection in "Questionnaire on women's course selection, continuing education, and leadership"

Women's course selection

A Course Decision

● First, you will be asked about the course you attended

Q 1 your birth month and year of birth

Year [ ][ ][ ][ ] Month [ ][ ]

Q 2 What is your final degree? Mark one number and the write down the date and year of your graduation.

1 Bachelor **2** Master **3** Doctor (including course work completed without degree)

Graduation Year [ ][ ][ ][ ] month [ ][ ]

Q 3 From where did you go to college in your freshman year? Mark one.

1 home **2** college dormitory **3** boarding house・apartment **4** others（write specifically： ）

Q 4 What is the course if your major? Mark one.（If more than one, mark one that you finished first.）

〔Faculty of Letters and Education〕

1 Philosophy
2 History
3 Geography
4 Literature, Japanese Language, Foreign Language
5 Education, Dance Education
6 Human and Social Sciences
7 Liberal Arts and Humanities
8 Languages and Culture
9 Performing Arts
10 Others（ ）

〔Faculty of Science〕

11 Mathematics
12 Physics
13 Chemistry
14 Biology
15 Information Sciences

〔Faculty of Home Economics・Faculty of Human Life and Environmental Sciences〕

16 Child Studies
17 Food
18 Clothing
19 Home management
20 Life and Environmental Science
21 Nutrition and Food Science
22 Human-Environmental Science
23 Human Life Studies
24 Others（ ）

S Q 1 When in college, which point of view were you studying? Stem or non-STEM? Mark one.

1 rather from the STEM point of view
2 rather from the non-STEM point of view
3 never been aware of that point

S Q 2　What was your priority when you chose your course, answer on Q4? Mark two appropriate choices.

1 the contents of the course
2 my best subject until high school
3 my interest in high school
4 the existence of a famous professor
5 advantage for employment
6 obtaining license
7 useful for everyday life
8 others（specifically:　　）

Q 5　Did anybody oppose the decision on your choice of course then?

1 Yes　　2 No

If so, write down the reasons for their opposition.

● Questions until your entry to Ochanomizu University

Q 6　Question about your high school. Mark one appropriate answer.

(a) What is the nature of establishment of your alma mater high school? Mark one appropriate answer.

1 national public　2 prefectural or city public　3 private　4 others（specifically:　　）

(b) Was your high school co-ed or all girls' high school?

1 co-ed　　2 all girls

(c) Tell me about the courses on senior year of high school?

1 took mostly non-STEM class
2 took mostly STEM class
3 took the same amount of non-STEM and STEM courses
4 others（specifically:　　）

(d) Was the teacher who mainly did academic and career counseling for you when you were high school senior female or male?

1 tfemale　　2 male　　3 have not been counseled

● Questions about your career and marriage.

Q 7　Post-graduation, which path di you take? Mark one appropriate answer.

1 got a job　2 continued farther degree or studied abroad　3 others（specifically:　　）

Q 8　Post-graduation, did you work accompanied by a salary ? Mark one appropriate.
Those who continued studying, answer according the choices of your post-graduation of masters of other studies.

1 full-time job
2 mainly part-time or temporary job or work
} go to S Q 1 on next page

3 other jobs（specifically:　　）
4 did not wok accompanied by a salary
} go to S Q 9 on page 5

For those who answered " 1 full-time job" or " 2 mainly part-time or temporary job or work" on Q8

S Q 1 What was the nature of your job? Mark one appropriate answer.

(If more than one, mark the number of the job that have the most salary.)

1 Managerial occupation (private enterprise, above manager of public official, board member etc.)

2 specialized and technical occupation (Mark one appropriate occupation from 1 to 15 below) →

1	engineer	9	elementary school teacher
2	system engineer	10	kindergarten teacher
3	medical doctor, dentist, veterinarian, pharmacist	11	nursery school teacher
4	judicial related (judge, lawyer, judicial scrivener, etc.)	12	curator
5	researcher in STEM	13	counsellor
6	researcher in non-STEM	14	nutritionist
7	teachers of STEM subjects of secondary school (science, mathematics, information science)		
8	teaches of subjects others NO7 of secondary school	15	others (specifically:)

3 office-work (clerk general of private enterprise or public official, education related academic affairs・desk-work assistant, secretary etc.)

4 sales and marketing work (private enterprise marketing and sales, retail store management, insurance solicitor etc.)

5 security, service business work (police officer, self-defense official, nursing care staff ,cabin attendant, etc.)

6 others (specifically:)

S Q 2 As a whole, how many people were employed there? Mark one appropriate answer.

(Not as an office, but as a company or as an organization as a whole)

1	1～29	3	100～499	5	1000 and more
2	30～99	4	500～999		

S Q 3 Do you still continue that job? Mark one appropriate answer.

1 quit (includes job-change and quitting and resuming work) 2 still on the same job → Q 9 on next page

S Q 3 - 1 questions for those who chose "quit". How many years did you work there?

[ ][ ] year [ ][ ] month

S Q 3 - 2 Why did you quit the job? Mark up to two reasons.

1	for retirement	6	for nursing for family	11	saw the limit on building career
2	for job change	7	for your health problem	12	relation between co workers
3	for marriage	8	harsh labor condition	13	others (specifically:)
4	for child birth and care	9	low income		
5	for spouse's job transfer	10	personnel cut, bankruptcy		

【for everyone】

Q 9　Do you now have a job accompanied by salary? Mark one appropriate answer.

1　full-time job
2　mainly part-time or temporary job or work
} go to S Q 1

3　other jobs（specifically:　　）
4　did not wok accompanied by a salary
} go to SQ10 on next page

S Q 1 **【for those who answered "1 full-time job" or "2 mainly part-time or temporary job or work" on Q9】**

What was the nature of your job? Mark one appropriate answer.

〔company, government office, educational institution, and other related groups〕

1　no position
2　subsection manager or equivalent position
3　section manager or equivalent position
4　director general or equivalent position
5　the president, director, officer, or equivalent position

〔university, junior college and related schools〕

6　technical officer, assistant
7　assistant professor
8　full-time lecturer
9　associate professor
10　professor
11　part-time lecturer
12　presidents, director, councilor, or equivalent position

〔kindergarten, elementary, secondary school and other related schools〕

13　teacher
14　vice principal or equivalent position
15　principal or equivalent position
16　others（　　）

〔others〕

17　others（precisely：　　）

S Q 2　How much is your personal income (including tax and pension income) Mark one appropriate answer.

1　below 2 million yen
2　2 million ~ below 4 million yen
3　4 million ~ below 6million yen
4　6 million ~ below 8 million yen
5　8 million ~ below 10 million yen
6　10 million yen and more

S Q 3　What are the reasons you work now. Mark two from below.

1　need my own income
2　need income to manage and aid family budget
3　maintain connection with society
4　only natural to be working
5　like working
6　want to make use of my knowledge , technique, and hobby
7　want to be independent economically
8　because it is family business
9　want to make friends through work
10　have nothing else to do
11　others（precisely：　　）

【for everyone】

Q10 Have you ever lived abroad? Mark one appropriate answer.

1 yes (☐☐ year ☐☐ month) 2 no

Q11 Are you married, at the moment? Mark one appropriate answer.

1 single → go to Q19 on page 13

2 married (including common-law marriage)

3 divorced or bereaved

【for those who answered 2,3 on Q11】 about your spouse (for those who answered 3, please answer as much as possible)

SQ1 What you spouse's educational back ground? Mark one appropriate answer.

1 finished compulsory education
2 high school
3 a special (vocational) school
4 junior college, technical college
5 bachelor degree
6 master or doctor degree
7 others (specifically)

SQ2 What is your spouses' form of occupation?

(a) What is the longest form of job employed? Mark one appropriate answer

1 full-time job 2 self-owned business 3 part-time job 4 others ( )

(b) What is the kind of job he was employed longest? Mark one appropriate answer.
(if more than one, mark the one with the highest salary.)

1 Managerial occupation (private enterprise, above manager of public official, board member etc.)

2 specialized and technical occupation (Mark one appropriate occupation from 1 to 15 below) →

1 engineer
2 system engineer
3 medical doctor, dentist, veterinarian, pharmacist
4 judicial related (judge, lawyer, judicial scrivener, etc.)
5 researcher in STEM
6 researcher in non-STEM
7 teachers of STEM subjects of secondary school (science, mathematics, information science)
8 teachers of subjects others NO7 of secondary school
9 elementary school teacher
10 kindergarten teacher
11 nursery school teacher
12 curator
13 counsellor
14 nutritionist
15 others (specifically:)

3 office-work (clerk general of private enterprise or public official, education related academic affairs・desk-work assistant, secretary etc.)

4 sales and marketing work (private enterprise marketing and sales, retail store management, insurance solicitor etc.)

5 security, service business work (police officer, self-defense official, nursing care staff ,cabin attendant, etc.)

6 others (specifically:)

SQ3 How much is your spouse's income.(including tax and pension income) Mark one appropriate answer.

1 below 2 million yen
2 2 million ～ below 4 million yen
3 2 million ～ below 4 million yen
4 6 million ～ below 8 million yen
5 4 million ～ below 6 million yen
6 10 million yen and more
7 I do not know

※Do you have children? Mark one appropriate answer.

1 yes

2 no

Move on to Q19 on page 13

※How many? Mark one appropriate answer.

1	2	3	4	5	6
one	two	three	four	five	more than six

Move on to Q12 on the next page

【for those who have children】

For Q12～Q14, answer on the entry column that apply to all the children. Leave blank, if you do not have 4th, 5th or other children.

Q12 tell us about the children's school and job situation.

- For age column, write down present age. For sex, choose and fill in the appropriate number from the list next page
- For the children's school and job situation, choose and fill in the appropriate number from the list next page.
- If you have children in college, graduate school, or working adult, choose and fill in the number that is closed to the field of majors.

	age			sex		school	Major in junior college, technical college	Major In Univ.	Major In Grad. School	job	If you chose 2 for jobs, write down the details from 1 to 15
Ex. (working adult)	2	6		1 M	(2) F			7		2	8
Ex. (student)	1	9		(1) M	2 F	10		2		A student does not have to write	
First child				1 M	2 F						
Second child				1 M	2 F						
Third child				1 M	2 F						
Fourth child				1 M	2 F						
Fifth child				1 M	2 F						

(school) choose appropriate number and answer on the entry column in the former page

1	home	4	elementary school	7	vocational school	10	university
2	nursery	5	lower secondary school	8	technical college	11	graduate school
3	kindergarten	6	upper secondary school	9	junior college	12	other school

(major field of study) choose appropriate number and answer on the entry column in the former page

1	Humanities	3	Science	5	Agriculture	7	Home Economics	9	Arts
2	Social Sciences	4	Engineering	6	Health Science (Medicine, Pharmaceuticals, others)				
						8	Education	10	others（ ）

(occupation) choose appropriate number and answer on the entry column in the former page

1 Managerial occupation（private enterprise, above manager of public official, board member etc.）

2 specialized and technical occupation（choose and fill in one appropriate occupation from 1 to 15 below）

1	engineer	9	elementary school teacher
2	system engineer	10	kindergarten teacher
3	medical doctor, dentist, veterinarian, pharmacist	11	nursery school teacher
4	judicial related（judge, lawyer, judicial scrivener, etc.）	12	curator
5	researcher in STEM	13	counsellor
6	researcher in non-STEM	14	nutritionist
7	teachers of STEM subjects of secondary school（science, mathematics, information science）		
8	teachers of subjects others NO7 of secondary school	15	others（specifically: ）

3 office-work（clerk general of private enterprise or public official, education related academic affairs, desk-work assistant, secretary etc.）

4 sales and marketing work（private enterprise marketing and sales, retail store management, insurance solicitor etc.）

5 security, service business work（police officer, self-defense official, nursing care staff ,cabin attendant, etc.）

6 others (specifically:)

7 no occupation

Q13 Questions about how you and your spouse were involved in the education of your children.

Mark the number below about which one of you got more involved for each of your children.

1 mainly you
2 mainly the spouse
3 you and spouse about the same involved
4 neither one of you

	first child	second child	third child	forth child	fifth child
1 asked about the school's everyday situation					
2 taught science and math(algebra)					
3 gave advice for independent research on science					
4 took the child to science museum or natural history museum					
5 took the child to science experiment class held by universities and local government					
6 observed natural phenomenon such as solar eclipse or growth of plants					
7 taught scientific knowledge in daily conversation					
8 gave advice on secondary school for applying					
9 consulted about course choices（STEM or non-STEM）in high school					
10 gave advice in high school to choose non-STEM course					
11 gave advice in high school to choose STEM course					
12 got consulted the field of major in college					
13 gave advice in university to choose non-STEM course					
14 gave advice in university to choose STEM course					
15 got consulted about seeking a job					

Q14 Does your child wish to proceed to university or departments related to STEM? Those who have already entered or graduated university, answer according to child's status before entering the university. Mark number 1 ～ 4 for each child.

1 she/he wishes （she/he wished）
2 she/he doesn't wish（ she/he didn't）
3 she/he hasn't decided（she/he didn't）
4 I don't know（I didn't）

first child	second child	third child	forth child	fifth child

※Do you have a daughter? Mark one appropriate answer.

1 yes → go to **Q15**
2 no → go to ※ in the next page

【for those who have a daughter】If you have more than one daughter, answer about the elder one.

Q15 What do you think about your daughter proceeding to STEM university or faculty? If she has already graduated, answer how you felt when she decided to go to STEM university or faculty.

1 good　2 relatively good → go to S Q 1

3 not so good　4 bad → go to S Q 2

S Q 1 **【Those who marked 1,2 on Q15】**

(a) Which faculty in particular do (did) you think would be good for that child to proceed? Mark up to three.

1	Science	4	Pharmaceuticals	7	Agriculture
2	Engineering	5	Public health or Nursing	8	thers（precisely： ）
3	Medicine	6	Dentistry	9	nothing in particular

(b) Why did you think it was better for her to proceed to STEM? Mark two most appropriate answer.

1	special education offered	5	be able to manage both household and work in the future		
2	promising future income	6	definite vision for the future		
3	suitable for girls	7	acquirement of license		
4	suitable for her	8	her wish to go	9	others（precisely： ）

S Q 2 **【Those who marked 3,4 on Q15】**

Why did you think (or thought) it was not a good idea? Mark 2 appropriate answers.

1	no versatilities	5	difficult to manage both household and work	9	other（precisely：）
2	expensive tuition	6	unclear future vision		
3	not suitable for girls	7	long enrollment period due to proceeding to masters or doctors degree		
4	not suitable for her	8	her wish not to go		

Q16 Is there any ideal figure as a woman, when your daughter is working? Mark as many as you wish.

1	myself	3	one of the relatives	5	one of the teacher I ‘ve met so far	7	no one in particular
2	someone famous	4	someone I know or friend	6	others		

Write as precisely as possible

※Do you have a son? Mark one appropriate answer.

1 Yes ⟶ go to **Q17**

2 No ⟶ go to **Q19** on the next page

【for those who have a son】If you have more than one son, answer about the elder one.

Q17 What do you think about your son proceeding to STEM university or faculty? If he has already graduated, answer how you felt when he decided to go to STEM university or faculty.

1 good **2** relatively good → go to S Q 1

3 not so good **4** bad → go to S Q 2

S Q 1 **【Those who marked 1,2 on Q15】**

(a) Which faculty in particular do (did) you think would be good for that child to proceed? Mark up to three.

1	Science	**4**	Pharmaceuticals	**7**	Agriculture
2	Engineering	**5**	Public health or Nursing	**8**	thers（precisely： ）
3	Medicine	**6**	Dentistry	**9**	nothing in particular

(b) Why did you think it was better for her to proceed to STEM? Mark two most appropriate answer.

1	special education offered	**5**	be able to manage both household and work in the future		
2	promising future income	**6**	definite vision for the future		
3	suitable for girls	**7**	acquirement of license		
4	suitable for her	**8**	her wish to go	**9**	others（precisely： ）

S Q 2 **【Those who marked 3,4 on Q15】**

Why did you think (or thought) it was not a good idea? Mark 2 appropriate answers.

1	no versatilities	**5**	difficult to manage both household and work	**9**	other（precisely：）
2	expensive tuition	**6**	unclear future vision		
3	not suitable for girls	**7**	long enrollment period due to proceeding to masters or doctors degree		
4	not suitable for her	**8**	her wish not to go		

Q18 Is there any ideal figure as a man, when your son is working? Mark as many as you wish

1	his father	**3**	one of the relatives	**5**	one of the teacher I ‘ve met so far	**7**	no one in particular
2	someone famous	**4**	someone I know or friend	**6**	others		

Write as precisely as possible

〔4〕

【for everyone】

● Questions about science & technology

Q19 Do you have interest in new or topics about science and technology? Mark one appropriate answer.

1 very interested　2 interested　3 not interested　4 not interested at all

Q20 Within the past 2-3 years, did you have experiences such as listed below? Mark one appropriate answer.

	often	Sometimes	almost never	never
1 going to art museums	1	2	3	4
2 going to science museums or natural history museums	1	2	3	4
3 reading books related to science and technology	1	2	3	4
4 going to concerts	1	2	3	4
5 going to lectures of scientists or engineers	1	2	3	4
6 attending “Science Café”* * discussing and learning science topics in a café like atmosphere	1	2	3	4

Q21 It is said that there is a positive and negative sides to the development of science and technology . Seeing everything as a whole, which aspect do you think is stronger? Mark one to appropriate answer.

1 more positive aspects
2 relatively more positive aspects
3 both about the same
4 relatively more negative aspects
5 more negative aspects
6 do not know

Q22 In which field do you think science and technology should contribute in the future? Mark as many answers that you think are important from the list below.

1 development of space and marine
2 conservation of global environment
3 resource and energy for the fulfillment of food, clothing, and shelter
4 medical science
5 food (agriculture, forestry and fishery)
6 support of housework
7 supporting lives of the elderly people
8 supporting the foundation of manufacturing technology and ICT
9 prevention of disaster and crime
10 others（precisely：　　）
11 nothing in particular

● Question about women's way of life

Q23 Questions about women's education and course selection. For each of the following question, mark the number closest to your idea.

	I agree	I agree partly	I disagree partly	I disagree
1 Women are suited to non-STEM	1	2	3	4
2 Women are suited to STEM	1	2	3	4
3 Women do not need to aim for a university with a competitive entrance exam	1	2	3	4
4 Not recommendable for women to take a year out for entrance exam.	1	2	3	4
5 Worried for women to live by herself in apartment to go to universities.	1	2	3	4
6 It is difficult for women to keep up with the studies of STEM faculty.	1	2	3	4
7 Environment is not prepared for women to proceed to STEM faculty	1	2	3	4
8 No advantage for women to obtain jobs after graduating STEM faculty	1	2	3	4
9 Not much jobs available a woman can continue working even if she attain something in a specific area	1	2	3	4
10 Meaningless for women to proceed master degree	1	2	3	4

Q24 What do you think, in general, about women having an occupation. Mark one appropriate answer.

1 Women should not have an occupation.
2 Women should had an occupation until marriage.
3 Women should hold occupation until she has a child
4 Women should continue holding occupation even if she has children.
5 Women should quit occupation if she has children and resume again when the children get older.
6 others（write precisely：　　）
7 I don't know

Q25 According to the international comparison of gender gap, Japan is placed low as 105th out of 135 countries,（Report from World Economic Forum 2013）Thus, it is said that it is a necessity for women to participate in economics and politics. Which methods you think are appropriate in order to achieve them. Mark two the most important answers below.

1 providing an environment for women to continue working whole raising a child
2 the reform of consciousness of women towards society
3 providing the educational opportunity to actualize the empowerment of women.
4 setting a clear target number to appoint and promote women
5 to visualize and disclose and collect quantitative data over the situation of women.
6 strong positive action such as quota system.
7 promotion of diversity in work
8 providing working women's role models
9 men's participation in raising children
10 others（precisely：　　）

Q26 This is the final question. What impact, do you think, would be made, as the number of women in STEM increases? Please wrote freely.

Appendix 2 Aggregate Results

Questions	Choices	N	%
Q1. Birth Year	Total	1966	100
	Before 1929	0	0
	1930 ~ 1939	67	3.4
	1940 ~ 1949	331	16.8
	1950 ~ 1959	406	20.7
	1960 ~ 1969	524	26.7
	1970 ~ 1979	513	26.1
	After 1980	124	6.3
	No answer	1	0.1
Q1. Birth Month	Total	1966	100
	January	199	10.1
	February	153	7.8
	March	172	8.7
	April	172	8.7
	May	170	8.6
	June	143	7.3
	July	167	8.5
	August	157	8
	September	179	9.1
	October	164	8.3
	November	158	8
	December	130	6.6
	No answer	2	0.1
Q2. Final Degree	Total	1966	100
	Bachelor		1409
	Master	341	17.3
	Doctor (including course work completed without degree)	150	7.6
	No answer	66	3.4

Q2. Year of Graduation	Total	1966	100
	Before 1960	7	0.4
	1961 ~ 1969	259	13.2
	1970 ~ 1979	344	17.5
	1980 ~ 1989	451	22.9
	1990 ~ 1999	536	27.3
	2000 ~ 2005	267	13.6
	After 2006	81	4.1
	No answer	21	1.1
Q2. Month of Graduation	Total	1966	100
	January	2	0.1
	February	2	0.1
	March	1847	93.9
	April	35	1.8
	May	4	0.2
	June	2	0.1
	July	2	0.1
	August	3	0.2
	September	36	1.8
	October	10	0.5
	November	2	0.1
	December	6	0.3
	No answer	15	0.8
Q3. Residents when Entering the University	Total	1966	100
	home	909	46.2
	college dormitory	413	21
	boarding house・apartment	535	27.2
	others	105	5.3
	No answer	4	0.2
Q4. Faculties and courses that one graduated	Total	1966	100
[Faculty of Letters and Education]	Philosophy	60	3.1

	History	71	3.6
	Geography	96	4.9
	Literature, Japanese Language, Foreign Language	266	13.5
	Education, Dance Education	177	9
	Human and Social Sciences	24	1.2
	Liberal Arts and Humanities	21	1.1
	Languages and Culture	45	2.3
	Performing Arts	32	1.6
	Others	10	0.5
[Faculty of Science]	Mathematics 13	128	6.5
	Physics	87	4.4
	Chemistry	130	6.6
	Biology	113	5.7
	Information Sciences	38	1.9
[Faculty of Home Economics・Faculty of Human Life and Environmental Sciences]	Child Studies	148	7.5
	Food	175	8.9
	Clothing	109	5.5
	Home management	90	4.6
	Life and Environmental Science	49	2.5
	Nutrition and Food Science	10	0.5
	Human-Environmental Science	0	0
	Human Life Studies	85	4.3
	others	1	0.1
	No answer	1	0.1
Q4. SQ1 Point of view one took when studying, STEM or non-STEM	Total	1966	100
	rather from the STEM point of view	776	39.5
	rather from the non-STEM point of view	924	47
	never been aware of that point	262	13.3
	No answer	4	0.2
Q4. SQ2 The priorities one valued when choosing the course	Total	1966	100
	the contents of the course	1242	63.2

	my best subject until high school	569	28.9
	my interest in high school	773	39.3
	the existence of a famous professor	28	1.4
	advantage for employment	136	6.9
	obtaining license	177	9
	useful for everyday life	164	8.3
	others	163	8.3
	No answer	3	0.2
Q5. Whether anybody oppose the decision on your choice of course	Total	1966	100
	yes	109	5.5
	no	1851	94.2
	No answer	6	0.3
Q5. Reason of opposition	Total	109	100
	filled	108	99.1
	blank	1	0.9
Q6(a). Nature of establishment of your high school	Total	1966	100
	national public	153	7.8
	prefectural or city public	1564	79.6
	private	245	12.5
	others	4	0.2
	No answer	0	0
Q6(b). Type of your high school	Total	1966	100
	Co-ed	1497	76.1
	all girls	465	23.7
	No answer	4	0.2
Q6(c). The courses on senior year of high school	Total	1966	100
	took mostly non-STEM class	697	35.5
	took mostly STEM class	687	34.9
	took the same amount of non-STEM and STEM courses	504	25.6
	others	75	3.8
	No answer	3	0.2

Q6(d). Gender of the career counselor in the senior year of high school	Total	1966	100
	female	280	14.2
	male	1402	71.3
	have not been counseled	278	14.1
	No answer	6	0.3
Q7. Career after graduating university	Total	1966	100
	got a job	1466	74.6
	continued farther degree or studied abroad	396	20.1
	others	102	5.2
	No answer	2	0.1
Q8. Working condition post-graduation	Total	1966	100
	full-time job	1646	83.7
	mainly part-time or temporary job or work	182	9.3
	other jobs	11	0.6
	did not wok accompanied by a salary	117	6
	No answer	10	0.5
Q8SQ1. Nature of your job after graduation	total	1828	100
	Managerial occupation	29	1.6
	specialized and technical occupation	1187	64.9
	office-work	435	23.8
	sales and marketing work	89	4.9
	security, service business work	15	0.8
	others	63	3.4
	No answer	10	0.5
Q8SQ1-2. Specialized and technical occupation	total	1187	100
	engineer	119	10
	system engineer	180	15.2
	medical doctor, dentist, veterinarian, pharmacist	3	0.3
	judicial related (judge, lawyer, judicial scrivener, etc.)	2	0.2
	researcher in STEM	215	18.1
	researcher in non-STEM	43	3.6

	teachers of STEM subjects of secondary school (science, mathematics, information science)	81	6.8
	teaches of subjects others NO7 of secondary school	270	22.7
	elementary school teacher	49	4.1
	kindergarten teacher	27	2.3
	nursery school teacher	9	0.8
	curator	1	0.1
	counsellor	18	1.5
	nutritionist	0	0
	others	170	14.3
	No answer	0	0
Q8SQ2. The number of employee in your company	total	1828	100
	1 ~ 29	159	8.7
	30 ~ 99	276	15.1
	100 ~ 499	304	16.6
	500 ~ 999	145	7.9
	1000 and more	900	49.2
	No answer	44	2.4
Q8SQ3. Continuation of the work	total	1828	100
	quit(includes job-change and quitting and resuming work)	1343	73.5
	still on the same job	472	25.8
	No answer	13	0.7
Q8SQ3-1. Length of years one continue working (year)	total	1343	100
	0year	56	4.2
	1 ~ 9years	1017	75.7
	10 ~ 19years	111	8.3
	20 ~ 29years	32	2.4
	30 ~ 39years	92	6.9
	40 ~ 49years	19	1.4
	50years and more	1	0.1
	No answer	15	1.1
Q8SQ3-1. Length of years one continue working (month)	total	1343	100

	0month	693	51.6
	1month	51	3.8
	2months	59	4.4
	3months	67	5
	4months	61	4.5
	5months	44	3.3
	6months	126	9.4
	7months	23	1.7
	8months	29	2.2
	9months	68	5.1
	10months	73	5.4
	11months	34	2.5
	No answer	15	1.1
Q8SQ3-2. Reasons one quitted job	total	1343	100
	for retirement	99	7.4
	for job change	246	18.3
	for marriage	398	29.6
	for child birth and care	257	19.1
	for spouse’s job transfer	138	10.3
	for nursing for family	22	1.6
	for your health problem	85	6.3
	harsh labor condition	76	5.7
	low income	14	1
	personnel cut, bankruptcy	15	1.1
	saw the limit on building career	123	9.2
	relation between co workers	33	2.5
	others	216	16.1
	No answer	4	0.3
Q9. Working condition at present	Total	1966	100
	full-time job	876	44.6
	mainly part-time or temporary job or work	403	20.5

	other jobs	143	7.3
	did not wok accompanied by a salary	528	26.9
	No answer	16	0.8
Q9SQ1. Job title at the present	total	1279	100
	no position	415	32.4
[company, government office, educational institution, and other related groups]	subsection manager or equivalent position	127	9.9
	section manager or equivalent position	84	6.6
	section manager or equivalent position	27	2.1
	the president, director, officer, or equivalent position	52	4.1
[university, junior college and related schools]	technical officer, assistant	7	0.5
	assistant professor	6	0.5
	full-time lecturer	15	1.2
	associate professor	30	2.3
	professor	53	4.1
	part-time lecturer	62	4.8
	presidents, director, councilor, or equivalent position	5	0.4
[kindergarten, elementary, secondary school and other related schools]	teacher	157	12.3
	vice principal or equivalent position	7	0.5
	principal or equivalent position	4	0.3
	others	54	4.2
[others]	others	156	12.2
	No answer	18	1.4
Q9SQ2. Annual income at the present	total	1279	100
	below 2 million yen	250	19.5
	2 million ~ below 4 million yen	186	14.5
	4 million ~ below 6 million yen	292	22.8
	6 million ~ below 8 million yen	250	19.5
	8 million ~ below 10 million yen	151	11.8
	10 million yen and more	131	10.2
	No answer	19	1.5
Q9SQ3. Reasons for working	total	1279	100

	need my own income	416	32.5
	need income to manage and aid family budget	302	23.6
	maintain connection with society	396	31
	only natural to be working	305	23.8
	like working	301	23.5
	want to make use of my knowledge , technique, and hobby	317	24.8
	want to be independent economically	272	21.3
	because it is family business	42	3.3
	want to make friends through work	12	0.9
	have nothing else to do	17	1.3
	others	72	5.6
	No answer	14	1.1
Q10. Life experience abroad	Total	1966	100
	yes	505	25.7
	no	1455	74
	No answer	6	0.3
Q10. Number of years living abroad	total	505	100
	0year	120	23.8
	1 ~ 4years	307	60.8
	5 ~ 9years	61	12.1
	10 ~ 14years	10	2
	15 ~ 19years	2	0.4
	20 ~ 24years	1	0.2
	25 ~ 29years	1	0.2
	30years以上	1	0.2
	No answer	2	0.4
Q10. Number of months living abroad	total	505	100
	0month	187	37
	1month	38	7.5
	2months	36	7.1
	3months	46	9.1

	4months	16	3.2
	5months	17	3.4
	6months	73	14.5
	7months	14	2.8
	8months	15	3
	9months	12	2.4
	10months	34	6.7
	11months	15	3
	No answer	2	0.4
Q11. Marital status at the present	Total	1966	100
	single	245	12.5
	married (including common-law marriage)	1568	79.8
	divorced or bereaved	152	7.7
	No answer	1	0.1
Q11SQ1. Educational back ground of spouse	total	1720	100
	finished compulsory education	2	0.1
	high school	45	2.6
	a special(vocational) school	25	1.5
	junior college, technical college	10	0.6
	bachelor degree	979	56.9
	master or doctor degree	644	37.4
	others	7	0.4
	No answer	8	0.5
Q11SQ2(a). Spouses' form of occupation	total	1720	100
	full-time job	1548	90
	self-owned business	128	7.4
	part-time job	7	0.4
	others	14	0.8
	No answer	23	1.3
Q11SQ2(b). Nature of spouse's job	total	1720	100
	Managerial occupation	542	31.5

	specialized and technical occupation	908	52.8
	office-work	135	7.8
	sales and marketing work	66	3.8
	security, service business work	16	0.9
	others	39	2.3
	No answer	14	0.8
Q11SQ2(b)-2. Specialized and technical occupation of spouse	total	908	100
	engineer	184	20.3
	system engineer	99	10.9
	medical doctor, dentist, veterinarian, pharmacist	109	12
	judicial related (judge, lawyer, judicial scrivener, etc.)	21	2.3
	researcher in STEM	220	24.2
	researcher in non-STEM	54	5.9
	teachers of STEM subjects of secondary school (science, mathematics, information science)	39	4.3
	teaches of subjects others NO7 of secondary school	82	9
	elementary school teacher	14	1.5
	kindergarten teacher	2	0.2
	nursery school teacher	0	0
	curator	1	0.1
	counsellor	1	0.1
	nutritionist	0	0
	others	81	8.9
	No answer	1	0.1
Q11SQ3. Annual income of spouse	total	1720	100
	below 2 million yen	37	2.2
	2 million ~ below 4 million yen	153	8.9
	4 million ~ below 6 million yen	235	13.7
	6 million ~ below 8 million yen	278	16.2
	8 million ~ below 10 million yen	284	16.5
	10 million yen and more	615	35.8
	I do not know	54	3.1

	No answer	64	3.7
Whether you have child or not	total	1720	100
	Yes	1477	85.9
	No	241	14
	No answer	2	0.1
Number of children	total	1477	100
	one	316	21.4
	two	810	54.8
	three	311	21.1
	four	37	2.5
	five	2	0.1
	more than six	0	0
	No answer	1	0.1

choices	1st child (N)	1st child (%)	2nd child (N)	2nd child (%)	3rd child (N)	3rd child (%)	4th child (N)	4th child (%)	5th child (N)	5th child (%)
Q12. Age of children	1476	100	1160	100	350	100	39	100	2	100
0 ~ 4years old	144	9.8	130	11.2	34	9.7	5	12.8	1	50
5 ~ 9years old	154	10.4	123	10.6	31	8.9	1	2.6	0	0
10 ~ 14years old	162	11	112	9.7	24	6.9	5	12.8	1	50
15 ~ 19years old	161	10.9	128	11	31	8.9	4	10.3	0	0
20 ~ 24years old	154	10.4	121	10.4	40	11.4	5	12.8	0	0
25 ~ 29years old	147	10	121	10.4	42	12	4	10.3	0	0
30 ~ 34years old	141	9.6	130	11.2	46	13.1	4	10.3	0	0
35 ~ 39years old	133	9	118	10.2	42	12	4	10.3	0	0
40years old and more	237	16.1	141	12.2	44	12.6	3	7.7	0	0
No answer	43	2.9	36	3.1	16	4.6	4	10.3	0	0
Q12. Gender of children	1476	100	1160	100	350	100	39	100	2	100
male	729	49.4	605	52.2	178	50.9	20	51.3	0	0
female	735	49.8	540	46.6	165	47.1	17	43.6	2	100
No answer	12	0.8	15	1.3	7	2	2	5.1	0	0
Q12. Children’s school	1476	100	1160	100	350	100	39	100	2	100
home	49	3.3	44	3.8	11	3.1	1	2.6	1	50
nursery	113	7.7	95	8.2	23	6.6	4	10.3	0	0
kindergarten	25	1.7	30	2.6	8	2.3	0	0	0	0
elementary school	187	12.7	128	11	31	8.9	5	12.8	1	50
lower secondary school	85	5.8	78	6.7	19	5.4	1	2.6	0	0
upper secondary school	105	7.1	86	7.4	26	7.4	5	12.8	0	0
vocational school	8	0.5	9	0.8	2	0.6	0	0	0	0
technical college	4	0.3	2	0.2	0	0	0	0	0	0
junior college	6	0.4	7	0.6	3	0.9	0	0	0	0
university	342	23.2	270	23.3	86	24.6	5	12.8	0	0
graduate school	134	9.1	80	6.9	32	9.1	3	7.7	0	0
other school	10	0.7	10	0.9	3	0.9	0	0	0	0
No answer	408	27.6	321	27.7	106	30.3	15	38.5	0	0

Q12. Children's major field of study in vocational school, technical college and junior college	1476	100	1160	100	350	100	39	100	2	100
Humanities	5	0.3	6	0.5	1	0.3	0	0	0	0
Social Sciences	4	0.3	4	0.3	0	0	0	0	0	0
Science	1	0.1	0	0	1	0.3	0	0	0	0
Engineering	1	0.1	5	0.4	2	0.6	0	0	0	0
Agriculture	1	0.1	0	0	1	0.3	0	0	0	0
Health Science (Medicine, Pharmaceuticals, others)	1	0.1	2	0.2	1	0.3	0	0	0	0
Home Economics	1	0.1	4	0.3	1	0.3	0	0	0	0
Education	1	0.1	0	0	0	0	0	0	0	0
Arts	6	0.4	5	0.4	3	0.9	0	0	0	0
others	12	0.8	6	0.5	2	0.6	1	2.6	0	0
No answer	1443	97.8	1128	97.2	338	96.6	38	97.4	2	100
Q12. Children's major field of study in university	1476	100	1160	100	350	100	39	100	2	100
Humanities	162	11	136	11.7	38	10.9	2	5.1	0	0
Social Sciences	152	10.3	113	9.7	44	12.6	2	5.1	0	0
Science	78	5.3	54	4.7	14	4	2	5.1	0	0
Engineering	93	6.3	55	4.7	29	8.3	1	2.6	0	0
Agriculture	13	0.9	21	1.8	9	2.6	1	2.6	0	0
Health Science (Medicine, Pharmaceuticals, others)	77	5.2	55	4.7	25	7.1	0	0	0	0
Home Economics	27	1.8	17	1.5	5	1.4	0	0	0	0
Education	25	1.7	25	2.2	1	0.3	0	0	0	0
Arts	23	1.6	21	1.8	3	0.9	3	7.7	0	0
others	25	1.7	19	1.6	8	2.3	2	5.1	0	0
No answer	801	54.3	644	55.5	174	49.7	26	66.7	2	100
Q12. Children's major field of study in graduate school	1476	100	1160	100	350	100	39	100	2	100
Humanities	23	1.6	15	1.3	5	1.4	0	0	0	0
Social Sciences	25	1.7	10	0.9	7	2	1	2.6	0	0
Science	51	3.5	34	2.9	8	2.3	1	2.6	0	0
Engineering	50	3.4	33	2.8	23	6.6	2	5.1	0	0
Agriculture	14	0.9	8	0.7	0	0	0	0	0	0
Health Science (Medicine, Pharmaceuticals, others)	22	1.5	21	1.8	10	2.9	0	0	0	0

Home Economics	1	0.1	1	0.1	0	0	0	0	0	0
Education	5	0.3	4	0.3	0	0	0	0	0	0
Arts	2	0.1	4	0.3	0	0	0	0	0	0
others	5	0.3	1	0.1	1	0.3	0	0	0	0
No answer	1278	86.6	1029	88.7	296	84.6	35	89.7	2	100
Q12. Nature of children's job	1476	100	1160	100	350	100	39	100	2	100
Managerial occupation	66	4.5	43	3.7	18	5.1	1	2.6	0	0
specialized and technical occupation	302	20.5	242	20.9	75	21.4	6	15.4	0	0
office-work	137	9.3	100	8.6	37	10.6	4	10.3	0	0
sales and marketing work	57	3.9	52	4.5	22	6.3	0	0	0	0
security, service business work	17	1.2	22	1.9	8	2.3	3	7.7	0	0
others	24	1.6	27	2.3	11	3.1	0	0	0	0
no job	43	2.9	38	3.3	11	3.1	2	5.1	0	0
No answer	830	56.2	636	54.8	168	48	23	59	2	100
Q12. Children’s specialized and technical occupation	302	100	242	100	75	100	6	100	0	0
engineer	53	17.5	47	19.4	13	17.3	1	16.7	0	0
system engineer	36	11.9	33	13.6	8	10.7	2	33.3	0	0
medical doctor, dentist, veterinarian, pharmacist	58	19.2	38	15.7	17	22.7	0	0	0	0
judicial related (judge, lawyer, judicial scrivener, etc.)	18	6	5	2.1	3	4	1	16.7	0	0
researcher in STEM	37	12.3	24	9.9	11	14.7	1	16.7	0	0
researcher in non-STEM	7	2.3	10	4.1	3	4	0	0	0	0
teachers of STEM subjects of secondary school (science, mathematics, information science)	6	2	4	1.7	0	0	0	0	0	0
teaches of subjects others NO7 of secondary school	11	3.6	11	4.5	3	4	0	0	0	0
elementary school teacher	10	3.3	8	3.3	1	1.3	0	0	0	0
kindergarten teacher	2	0.7	0	0	0	0	0	0	0	0
nursery school teacher	0	0	0	0	0	0	0	0	0	0
curator	2	0.7	0	0	0	0	0	0	0	0
counsellor	2	0.7	6	2.5	2	2.7	0	0	0	0
nutritionist	2	0.7	5	2.1	2	2.7	0	0	0	0
others	49	16.2	36	14.9	9	12	1	16.7	0	0
No answer	9	3	15	6.2	3	4	0	0	0	0

Q13. Parents' involvement in child's education										
1. asked about the school's everyday situation	1476	100	1160	100	350	100	39	100	2	100
mainly you	999	67.7	805	69.4	245	70	24	61.5	1	50
mainly the spouse	6	0.4	2	0.2	1	0.3	0	0	0	0
you and spouse about the same involved	255	17.3	174	15	49	14	6	15.4	0	0
neither one of you	19	1.3	34	2.9	10	2.9	1	2.6	0	0
No answer	197	13.3	145	12.5	45	12.9	8	20.5	1	50
2. taught science and math (algebra)	1476	100	1160	100	350	100	39	100	2	100
mainly you	652	44.2	516	44.5	157	44.9	12	30.8	1	50
mainly the spouse	175	11.9	122	10.5	31	8.9	3	7.7	0	0
you and spouse about the same involved	192	13	125	10.8	31	8.9	2	5.1	0	0
neither one of you	205	13.9	197	17	71	20.3	11	28.2	0	0
No answer	252	17.1	200	17.2	60	17.1	11	28.2	1	50
3. gave advice for independent research on science	1476	100	1160	100	350	100	39	100	2	100
mainly you	616	41.7	480	41.4	141	40.3	14	35.9	1	50
mainly the spouse	164	11.1	117	10.1	34	9.7	2	5.1	0	0
you and spouse about the same involved	148	10	105	9.1	32	9.1	1	2.6	0	0
neither one of you	266	18	236	20.3	78	22.3	12	30.8	0	0
No answer	282	19.1	222	19.1	65	18.6	10	25.6	1	50
4. took the child to science museum or natural history museum	1476	100	1160	100	350	100	39	100	2	100
mainly you	406	27.5	315	27.2	89	25.4	6	15.4	0	0
mainly the spouse	151	10.2	120	10.3	43	12.3	1	2.6	0	0
you and spouse about the same involved	535	36.2	412	35.5	122	34.9	15	38.5	1	50
neither one of you	141	9.6	128	11	42	12	8	20.5	0	0
No answer	243	16.5	185	15.9	54	15.4	9	23.1	1	50
5. took the child to science experiment class held by universities and local government	1476	100	1160	100	350	100	39	100	2	100
mainly you	237	16.1	179	15.4	50	14.3	3	7.7	0	0
mainly the spouse	53	3.6	36	3.1	15	4.3	1	2.6	1	50
you and spouse about the same involved	90	6.1	73	6.3	20	5.7	1	2.6	0	0
neither one of you	749	50.7	602	51.9	178	50.9	24	61.5	0	0
No answer	347	23.5	270	23.3	87	24.9	10	25.6	1	50

6. observed natural phenomenon such as solar eclipse or growth of plants	1476	100	1160	100	350	100	39	100	2	100
mainly you	590	40	466	40.2	138	39.4	12	30.8	1	50
mainly the spouse	134	9.1	99	8.5	30	8.6	3	7.7	0	0
you and spouse about the same involved	332	22.5	247	21.3	74	21.1	8	20.5	0	0
neither one of you	175	11.9	156	13.4	46	13.1	6	15.4	0	0
No answer	245	16.6	192	16.6	62	17.7	10	25.6	1	50
7. taught scientific knowledge in daily conversation	1476	100	1160	100	350	100	39	100	2	100
mainly you	390	26.4	308	26.6	73	20.9	6	15.4	0	0
mainly the spouse	249	16.9	194	16.7	56	16	5	12.8	0	0
you and spouse about the same involved	450	30.5	325	28	108	30.9	11	28.2	1	50
neither one of you	141	9.6	139	12	48	13.7	7	17.9	0	0
No answer	246	16.7	194	16.7	65	18.6	10	25.6	1	50
8. gave advice on secondary school for applying	1476	100	1160	100	350	100	39	100	2	100
mainly you	484	32.8	370	31.9	110	31.4	7	17.9	0	0
mainly the spouse	54	3.7	42	3.6	16	4.6	4	10.3	0	0
you and spouse about the same involved	394	26.7	312	26.9	92	26.3	7	17.9	0	0
neither one of you	217	14.7	188	16.2	60	17.1	7	17.9	1	50
No answer	327	22.2	248	21.4	72	20.6	14	35.9	1	50
9. consulted about course choices (STEM or non-STEM)in high school	1476	100	1160	100	350	100	39	100	2	100
mainly you	303	20.5	225	19.4	81	23.1	6	15.4	0	0
mainly the spouse	34	2.3	26	2.2	6	1.7	2	5.1	0	0
you and spouse about the same involved	246	16.7	187	16.1	51	14.6	3	7.7	0	0
neither one of you	459	31.1	386	33.3	120	34.3	14	35.9	1	50
No answer	434	29.4	336	29	92	26.3	14	35.9	1	50
10. gave advice in high school to choose non-STEM course	1476	100	1160	100	350	100	39	100	2	100
mainly you	63	4.3	55	4.7	12	3.4	1	2.6	0	0
mainly the spouse	8	0.5	5	0.4	0	0	0	0	0	0
you and spouse about the same involved	35	2.4	31	2.7	9	2.6	1	2.6	0	0
neither one of you	846	57.3	669	57.7	215	61.4	23	59	1	50
No answer	524	35.5	400	34.5	114	32.6	14	35.9	1	50
11. gave advice in high school to choose STEM course	1476	100	1160	100	350	100	39	100	2	100

mainly you	70	4.7	47	4.1	15	4.3	0	0	0	0
mainly the spouse	26	1.8	22	1.9	4	1.1	1	2.6	0	0
you and spouse about the same involved	94	6.4	62	5.3	14	4	1	2.6	0	0
neither one of you	781	52.9	639	55.1	204	58.3	22	56.4	1	50
No answer	505	34.2	390	33.6	113	32.3	15	38.5	1	50
12. got consulted the field of major in college	1476	100	1160	100	350	100	39	100	2	100
mainly you	196	13.3	144	12.4	36	10.3	3	7.7	0	0
mainly the spouse	83	5.6	45	3.9	13	3.7	0	0	0	0
you and spouse about the same involved	183	12.4	148	12.8	46	13.1	4	10.3	0	0
neither one of you	543	36.8	459	39.6	153	43.7	17	43.6	1	50
No answer	471	31.9	364	31.4	102	29.1	15	38.5	1	50
13. gave advice in university to choose non-STEM course	1476	100	1160	100	350	100	39	100	2	100
mainly you	48	3.3	36	3.1	6	1.7	2	5.1	0	0
mainly the spouse	9	0.6	6	0.5	4	1.1	0	0	0	0
you and spouse about the same involved	34	2.3	27	2.3	11	3.1	1	2.6	0	0
neither one of you	838	56.8	674	58.1	213	60.9	21	53.8	1	50
No answer	547	37.1	417	35.9	116	33.1	15	38.5	1	50
14. gave advice in university to choose STEM course	1476	100	1160	100	350	100	39	100	2	100
mainly you	54	3.7	37	3.2	12	3.4	0	0	0	0
mainly the spouse	25	1.7	15	1.3	4	1.1	1	2.6	0	0
you and spouse about the same involved	79	5.4	58	5	12	3.4	0	0	0	0
neither one of you	789	53.5	647	55.8	201	57.4	22	56.4	1	50
No answer	529	35.8	403	34.7	121	34.6	16	41	1	50
15. got consulted about seeking a job	1476	100	1160	100	350	100	39	100	2	100
mainly you	146	9.9	117	10.1	30	8.6	2	5.1	0	0
mainly the spouse	83	5.6	67	5.8	16	4.6	1	2.6	0	0
you and spouse about the same involved	200	13.6	153	13.2	44	12.6	3	7.7	0	0
neither one of you	543	36.8	434	37.4	148	42.3	16	41	1	50
No answer	504	34.1	389	33.5	112	32	17	43.6	1	50
Q14. Child's wish to go to STEM university or faculty	1476	100	1160	100	350	100	39	100	2	100
she/he wishes (she/he wished)	509	34.5	367	31.6	119	34	9	23.1	0	0

she/he doesn’t wish (she/he didn’t)	486	32.9	408	35.2	126	36	13	33.3	0	0
she/he hasn’t decided (she/he didn’t)	276	18.7	250	21.6	69	19.7	9	23.1	0	0
I don’t know (I didn’t)	50	3.4	43	3.7	12	3.4	2	5.1	2	100
No answer	155	10.5	92	7.9	24	6.9	6	15.4	0	0

Questions	Choices	N	%
Whether you have a daughter or not	total	1477	100
	yes	1055	71.4
	no	392	26.5
	No answer	30	2
Q15. Daughters proceeding to STEM university or faculty	total	1055	100
	good	588	55.7
	relatively good	239	22.7
	not so good	135	12.8
	bad	50	4.7
	No answer	43	4.1
Q15SQ1(a). Faculties in STEM which you think would be good for daughters to proceed	total	827	100
	Science	255	30.8
	Engineering	126	15.2
	Medicine	306	37
	Pharmaceuticals	325	39.3
	Public health or Nursing	121	14.6
	Dentistry	33	4
	Agriculture	136	16.4
	others	35	4.2
	nothing in particular	200	24.2
	No answer	9	1.1
Q15SQ1(b). Reasons why you think it is good for daughters to proceed to STEM	total	827	100
	special education offered	419	50.7
	promising future income	54	6.5
	suitable for girls	35	4.2
	suitable for her	152	18.4
	be able to manage both household and work in the future	92	11.1
	definite vision for the future	139	16.8
	acquirement of license	181	21.9
	her wish to go	243	29.4

	others	37	4.5
	No answer	19	2.3
Q15SQ2. Reasons why you do not think it is good for daughters to proceed to STEM	total	185	100
	no versatilities	1	0.5
	expensive tuition	3	1.6
	not suitable for girls	1	0.5
	not suitable for her	122	65.9
	difficult to manage both household and work	3	1.6
	unclear future vision	1	0.5
	long enrollment period due to proceeding to masters or doctors degree	3	1.6
	her wish not to go	155	83.8
	others	8	4.3
	No answer	0	0
Q16. The ideal women figure which you would want your daughter to become	total	1055	100
	myself	93	8.8
	someone famous	62	5.9
	one of the relatives	28	2.7
	someone I know or friend	96	9.1
	one of the teacher I have met so far	44	4.2
	others	46	4.4
	no one in particular	752	71.3
	No answer	19	1.8
Q16. The ideal women figure which you would want your daughter to become(specifically)	total	1055	100
	filled in	205	19.4
	not filled in	850	80.6
Whether you have a son or not	total	1477	100
	yes	1072	72.6
	no	329	22.3
	No answer	76	5.1
Q17. Sons proceeding to STEM university or faculty	total	1072	100
	good	631	58.9

	relatively good	267	24.9
	not so good	118	11
	bad	26	2.4
	No answer	30	2.8
Q17SQ1(a). Faculties in STEM which you think would be good for sons to proceed	total	898	100
	Science	398	44.3
	Engineering	476	53
	Medicine	321	35.7
	Pharmaceuticals	81	9
	Public health or Nursing	14	1.6
	Dentistry	22	2.4
	Agriculture	138	15.4
	others	18	2
	nothing in particular	195	21.7
	No answer	10	1.1
Q17SQ1(b). Reasons why you think it is good for sons to proceed to STEM	total	898	100
	special education offered	511	56.9
	promising future income	93	10.4
	suitable for boys	29	3.2
	suitable for him	292	32.5
	be able to manage both household and work in the future	7	0.8
	definite vision for the future	153	17
	acquirement of license	98	10.9
	his wish to go	294	32.7
	others	34	3.8
	No answer	20	2.2
Q17SQ2. Reasons why you do not think it is good for sons to proceed to STEM	total	144	100
	no versatilities	3	2.1
	expensive tuition	2	1.4
	not suitable for boys	0	0
	not suitable for him	97	67.4

	difficult to manage both household and work	1	0.7
	unclear future vision	2	1.4
	long enrollment period due to proceeding to masters or doctors degree	1	0.7
	his wish not to go	117	81.3
	others	7	4.9
	No answer	0	0
Q18. The ideal men figure which you would want your son to become	total	1072	100
	his father		252
	someone famous	62	5.8
	one of the relatives	74	6.9
	someone I know or friend	65	6.1
	one of the teacher I have met so far	20	1.9
	others	27	2.5
	no one in particular	674	62.9
	No answer	19	1.8
Q18. The ideal men figure which you would want your son to become(specifically)	total	1072	100
	filled in	198	18.5
	not filled in	874	81.5
Q19. Interest in news and topics of science and technology	total	1966	100
	very interested	337	17.1
	interested	1374	69.9
	not interested	212	10.8
	not interested at all	3	0.2
	I don't know	40	2
Q20. Experience within the past 2-3 years			
1 going to art museums	total	1966	100
	often	502	25.5
	sometimes	960	48.8
	almost never	306	15.6
	never	166	8.4
	No answer	32	1.6

2 going to science museums or natural history museums	total	1966	100
	often	195	9.9
	sometimes	1060	53.9
	almost never	517	26.3
	never	159	8.1
	No answer	35	1.8
3 reading books related to science and technology	total	1966	100
	often	246	12.5
	sometimes	811	41.3
	almost never	644	32.8
	never	230	11.7
	No answer	35	1.8
4 going to concerts	total	1966	100
	often	440	22.4
	sometimes	924	47
	almost never	377	19.2
	never	188	9.6
	No answer	37	1.9
5 going to lectures of scientists or engineers	total	1966	100
	often	79	4
	sometimes	378	19.2
	almost never	691	35.1
	never	772	39.3
	No answer	46	2.3
6 attending “Science Café”	total	1966	100
	often	16	0.8
	sometimes	51	2.6
	almost never	207	10.5
	never	1641	83.5
	No answer	51	2.6
Q21. Concerning the development for science and technology	total	1966	100

	more positive aspects	664	33.8
	relatively more positive aspects	907	46.1
	both about the same	295	15
	relatively more negative aspects	25	1.3
	more negative aspects	5	0.3
	do not know	48	2.4
	No answer	22	1.1
Q22. Fields science and technology should be contributed	total	1966	100
	development of space and marine	545	27.7
	conservation of global environment	1594	81.1
	resource and energy for the fulfillment of food, clothing, and shelter	1334	67.9
	medical science	1554	79
	food (agriculture, forestry and fishery)	1019	51.8
	support of housework	359	18.3
	supporting lives of the elderly people	1096	55.7
	supporting the foundation of manufacturing technology and ICT	793	40.3
	prevention of disaster and crime	978	49.7
	others	51	2.6
	nothing in particular	8	0.4
	No answer	16	0.8
Q23. The thoughts concerning women's education and course selection			
1 Women are suited to non-STEM	total	1966	100
	I agree	50	2.5
	I agree partly	459	23.3
	I disagree partly	785	39.9
	I disagree	633	32.2
	No answer	39	2
2 Women are suited to STEM	total	1966	100
	I agree	47	2.4
	I agree partly	263	13.4
	I disagree partly	1030	52.4

	I disagree	576	29.3
	No answer	39	2
3 Women do not need to aim for a university with a competitive entrance exam	total	1966	100
	I agree	12	0.6
	I agree partly	42	2.1
	I disagree partly	403	20.5
	I disagree	1488	75.7
	No answer	21	1.1
4 Not recommendable for women to take a year out for entrance	total	1966	100
	I agree	33	1.7
	I agree partly	175	8.9
	I disagree partly	522	26.6
	I disagree	1218	62
	No answer	18	0.9
5 Worried for women to live by herself in apartment to go to universities.	total	1966	100
	I agree	127	6.5
	I agree partly	449	22.8
	I disagree partly	557	28.3
	I disagree	816	41.5
	No answer	17	0.9
6 It is difficult for women to keep up with the studies of STEM faculty.	total	1966	100
	I agree	7	0.4
	I agree partly	127	6.5
	I disagree partly	650	33.1
	I disagree	1167	59.4
	No answer	15	0.8
7 Environment is not prepared for women to proceed to STEM faculty	total	1966	100
	I agree	54	2.7
	I agree partly	430	21.9
	I disagree partly	827	42.1
	I disagree	631	32.1

	No answer	24	1.2
8 No advantage for women to obtain jobs after graduating STEM faculty	total	1966	100
	I agree		
	I agree partly	241	12.3
	I disagree partly	886	45.1
	I disagree	778	39.6
	No answer	24	1.2
9 Not much jobs available a woman can continue working even if she attain something in a specific area	total	1966	100
	I agree	139	7.1
	I agree partly	705	35.9
	I disagree partly	663	33.7
	I disagree	441	22.4
	No answer	18	0.9
10 Meaningless for women to proceed master degree	total	1966	100
	I agree	5	0.3
	I agree partly	43	2.2
	I disagree partly	630	32
	I disagree	1274	64.8
	No answer	14	0.7
Q24. About women having an occupation (compared to the pole on gender equality)	total	1966	100
	Women should not have an occupation	5	0.3
	Women should had an occupation until marriage	9	0.5
	Women should hold occupation until she has a child	40	2
	Women should continue holding occupation even if she has children	1262	64.2
	Women should quit occupation if she has children and resume again when the children get older	257	13.1
	others	315	16
	I do not know	67	3.4
	No answer	11	0.6
Q25. Appropriate methods for women to participate in economics and politics	total	1966	100
	providing an environment for women to continue working whole raising a child	1443	73.4
	the reform of consciousness of women towards society	597	30.4

	providing the educational opportunity to actualize the empowerment of women	190	9.7
	setting a clear target number to appoint and promote women to visualize and disclose and collect	114	5.8
	quantitative data over the situation of women	118	6
	strong positive action such as quota system	174	8.9
	promotion of diversity in work	452	23
	providing working women's role models	177	9
	men's participation in raising children	446	22.7
	others	119	6.1
	No answer	17	0.9
Q26. The impact of that women learn in STEM increases	total	1966	100
	filled in	1108	56.4
	not filled in	858	43.6

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Published at Graduate School of Innovation and Technology Management, Yamaguchi University, 2-16-1 Tokiwadai Ube city Yamaguchi 755-8611, Japan
Phone:+81-836-85-9876 FAX：+81-836-85-9877
e-mail:hayashiy@yamaguchi-u.ac.jp
Composed, printed, and bounded by Sankyo Insatsu, Ltd.
1953-8 Ohaza Tsumazakigaisaku Ube city Yamaguchi 759-0204, Japan
Phone:+81-836-44-4444 FAX：+81-836-44-4141
E-mail sp4444@k3.dion.ne.jp