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Educational Assortative Mating in Japan
and the United States

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Abstract

We investigate different patterns of educational assortative mating between Japan and the United States. Unlike the conventional approach which exclusively looks at married couples, we take a promising alternative one to include unmarried couples in the analysis and to compare the patterns of educational assortative mating across different partnership statuses. To highlight the distinctive patterns of Japanese couples, we provide the comparison between the case of Japan and that of the United States. The log-linear model analysis with the JLPS for Japanese couples and the NSFG for couples in the United States gave the following results. For the case of Japan, we found the significant difference in the pattern of educational assortative mating between married and unmarried couples, which is characterized as a stronger educational homogamy among married couples who graduated from college than among unmarried college-educated couples and as a propensity for women with junior college education to marry with men of college education. The result for the United States shows a different fabric. We found a clear propensity to find partners with the same level of education at the top and at the bottom of educational hierarchy, but the magnitude of the propensity does not vary across three types of couples: dating, cohabitation and married couples. Some discussions and speculations based on these findings are drawn for the understanding of the transition from courtship to marriage in Japan.

Keywords: educational assortative mating, marriage, courtship

1. INTRODUCTION

We investigate patterns of educational assortative mating in Japan and the United States. Couples, whether married or unmarried, are formed on the basis of matching on a variety of socioeconomic and cultural characteristics, shaping a distinct pattern of assortative mating. The resemblances or differences between matched couples reflect the extent of closure or openness in our society, a longstanding concern for sociologists (Blossfeld 2009). Among the various factors couples take into account, education is one of the most well-established measures in assortative mating (Blossfeld 2008, Miwa 2005, Schwartz and Mare 2005).

The conventional approach taken by many previous studies targeted at married couples as the primary focus of the analysis. The main research question concerns educational assortative mating among married couples: who marries whom¹. However, the past decades have seen the tremendous increase of cohabitation among unmarried couples in the United States and European countries, a well-documented fact which motivated researchers to look at the difference in the pattern of assortative mating between married couples and unmarried couples. Recent progress in data gathering on unmarried couples led to this new development, particularly in the United States. Thus, researchers can now reframe the research question as follows: who mates with whom among dating, cohabitating, and married couples².

On the other hand, it is often pointed out that Japanese society has not experienced the dramatic increase of cohabitation as observed in the United States or Europe. However, unmarried couples and courtship (as a partnership status) are no longer uncommon in contemporary Japan. Today most of marriages are formed as love-marriage (*ren-ai kekkon*)³, implying that many married couples must have experienced courtship state

¹ Blossfeld (2009) provides an extensive review of the literature from a cross-country perspective. For examples of previous analyses on Japanese couples, see Miwa (2005), Shida et al. (2000) and Shirahase (1999).

² Schwartz (2010, p. 736-738) provides a concise summary of recent developments in the comparative investigation between married and unmarried cohabitating couples. Blackwell and Lichter (2004) classify three partnership statuses, i.e., "dating," cohabitating," and "married" couples. We employ the same three categories for the analysis of American data set.

³ Based on the calculations from the 13th Japanese National Fertility Survey conducted in 2005, the National Institute of Population and Social Security Research (2007, p.18) reports that 86.8% of the married couples in the survey formed their marriage as

prior to marriage. Despite the lack of prevalence of cohabitation, courtship has become an important life stage for Japanese youth. We therefore examine the topic of assortative mating by expanding our scope to include unmarried couples into the analysis of Japanese data. To our knowledge, there is no previous research which distinguishes the patterns of educational assortative mating between married and unmarried couples in Japan. Our paper presents the first systematic account on this topic.

Moreover, comparison between Japanese married and unmarried couples will contribute to our understanding of marriage behavior in Japan. Courtship behavior of unmarried couples including the pattern of assortative mating is one of the most under-explored topics in Japanese sociological studies in general and marriage studies in particular, despite the potential importance of its role as the transitory state leading to marriage. Our explicit distinction of couples by partnership status will highlight the difference between the types of couples and the relationship between courtship and marriage. We will provide the comparison with the United States in order to highlight the distinct patterns of Japanese couples.

The next section explains the datasets and methods used in our analysis. The third section reports the results of our analyses for Japan and the United States. The final section summarizes the main findings and discusses some implications of the differences in the pattern of educational assortative mating between the two nations.

2. DATA AND METHODS

To characterize distinct patterns of educational assortative mating, we use datasets which allow us to specify educational levels of both marital and non-marital couples. We use the Japanese Life Course Panel Survey (JLPS) for Japanese couples⁴. The JLPS is a nationally representative panel survey conducted annually by the Center for Social Research and Data Archives at the University of Tokyo. The sample design included men and women between the ages of 20 to 34 (youth sample) and 35 to 40 (middle-aged

love-marriage.

⁴ We gratefully acknowledge the support of the Grant-in-Aid for Scientific Research (S) (number 18103003 and 22223005) from the Japan Society for the Promotion of Science (JSPS) and research support from the Institute of Social Science, University of Tokyo, and Outsourcing, Inc. in conducting the panel surveys. The permission to use the panel data is obtained from the Research Planning Committee of the JLPS.

sample) living Japan in 2007. We use the information collected in wave 1 (2007) through wave 5 (2011) when the respondents were 24 to 44.

The data for couples in the United States come from the National Survey of Family Growth (NSFG). The NSFG is a nationally representative survey conducted by the National Center for Health Statistics for the U.S. Department of Health and Human Services. The survey is cross-sectional in design but conducted periodically. The sample design included men and women in the United States between the ages of 15 to 45 during the survey period. We use the 2006-2010 survey which was conducted from June 2006 to June 2010.⁵

We differentiate two partnership statuses for couples in Japan and three for couples in the United States. For Japanese couples, we consider two kinds of status: dating couple in which both partner are unmarried at the time of survey and married couple. Three kinds of status are distinguished for the couples in the United States. The first status is unmarried and dating couple (denoted by "dating couple" hereafter); second is unmarried cohabitating couple (called "cohabitating couple"); and third is married couple. Cohabiting couples are classified as a separate category because they form more stable partnership than dating couples and constitute a substantial portion of the distribution of unmarried people. The resulting cross-classified data (observed frequencies) of each educational assortative mating is given in Table 1A for Japanese couples and in Table 1B for couples in the United States.

We use log-linear models which are fitted to the cross-classified data for Japanese couples and couples in the United States. The greatest advantage of log-linear models is that they can estimate the likelihood of couple formation of the specific educational combinations with the specifications of interaction parameters which we explain in the following, while controlling for different marginal distributions of education for men and women.

We take female education as a row variable and male education as a column variable. Partnership status is a layer variable, for which we classify couples into either married

⁵ Note that the sample is restricted to those of the ages of 20 to 44 at the time of the survey in order to assure comparability of the age range with the JLPS. We also restrict our analysis to respondents who form couples of the same race (racially homogamous couples). We obtained the dataset from the website of the National Survey of Family Growth.

or unmarried status in the JLPS and either dating, cohabitating or married status in the NSFG⁶. Thus our log-linear models are estimated for the three way table (row by column by layer). The same analytical strategy is applied to both the JLPS and the NSFG. We start from the model in which each diagonal cell in a different education and in a different partnership state has a unique parameter, which is equivalent to the Quasi-Independence model in the social mobility literature. With this model as a benchmark, we apply different log-linear models to the three way table and seek to arrive at the best-fitting model in our analysis to describe the pattern of association between men's and women' education. Each of the models we apply differs in the specifications of interaction parameters. The differences among the models can be demonstrated usually in a design matrix form, which we display in Figure 1A for the JLPS and in Figure 1B for the NSFG respectively.

After estimating these different log-linear models for the JLPS and the NSFG separately, we step to the standard model selection procedure which is based on Likelihood Ratio Chi-squared statistics (L-squared) and Bayesian Information Criteria (BIC). The obtained statistics for each model are reported in Table 2A for the JLPS and in Table 2B for the NSFG respectively. The statistics clearly show our best-fitting model for Japan is Model 6 and the one for the United States is Model 7. Thus we report the results of each our best-fitting model for Japan and the United States in the next section.⁷

3. PATTERNS OF EDUCATIONAL ASSORTATIVE MATING

Figures 2 and 3 show the pattern of educational assortative mating in Japan among unmarried couples (Figure 2) and married couples (Figure 3).⁸ The figures show which combinations of education are found significant among the couples, and the bars represent the presence of significant association. Among unmarried couples, educational

⁶ Previous research found a strong tendency of racial homogamy in the United States in addition to educational one. This suggests that our analysis should incorporate race as another layer variable. We estimated models allowing for patterns of educational assortative mating to vary by race, Whites and Non-whites. The model comparison tests, however, indicated that the models were not significantly different by race. So we present the results which assume the same model for Whites and Non-whites.

⁷ We first analyzed data separately for Japan and the United States. Once we arrived at the best-fitting model for each nation, we conducted statistical tests for the difference in parameters across nations.

⁸ The figures plot the log multiplicative parameters estimated from our best fitting model.

homogamy is found at the top and bottom levels of education: men and women with college education are more likely to become partners with each other, and men and women with high school education are more likely to become partners with each other than people with other combinations of education. The degree of homogamy is stronger among college-educated couples than among couples with high school education. Among married couples, the same pattern of educational homogamy is found. In addition, there is a tendency of hypergamy (marrying up) among women with junior college education: women who graduated from junior college are more likely to get married with men who graduated from four-year university.⁹ The most important finding in Japan is that the patterns of educational assortative mating are different among unmarried and married couples. There is a more apparent structuring among married couples. The strength of educational homogamy among college-educated couples is stronger among married couples than among unmarried couples. There is an additional association of hypergamy among married couples.

Figure 4 presents the pattern of educational assortative mating among couples in the United States. Although we distinguished married couples, cohabitation couples, and dating couples, the pattern of association is the same among three types of couples. The actual pattern of association in the United States resembles that in Japan. First, there is a strong tendency for people with B.A. degrees to form partnerships, and this level of educational homogamy is almost the same as that among Japanese married couples. Second, at the lowest level of education, there is a tendency of educational homogamy: those with high school education tend to form partnership with each other. The extent of homogamy is significantly stronger than that in Japan. The reason for the strong level of homogamy derives from the fact that more than 40 percent of those with high school education are high school dropouts in the United States. High school dropouts constitute the lowest level of educational attainment, and tend to have difficult times in finding partners with higher levels of education. Those with high school diploma tend to form partnership with those with a similar level of education but the extent of homogamy is lower than that among high school dropouts. Third, women with AA degrees have a tendency of hypergamy, that is, marrying up or forming partnership with those with BA degrees. In addition, women with some college have a tendency to find partners who have education lower than themselves. Because women

⁹ The second level of education includes women who attended technical colleges (*senmon gakkō*) in addition to junior college. However, the tendency of hypergamy is observed only among women with junior college diploma.

with some college are composed of those with AA degrees and those who dropped out of the college, they have propensity to form partnership with those with different levels of education.

4. DISCUSSION

Our paper is the first systematic attempt to distinguish the pattern of educational assortative mating between married and unmarried couples in Japan. As far as we know, none of the previous research examined the pattern of educational association under courtship. The most significant finding of our analysis is the difference in the pattern of educational assortative mating between married and courtship couples in Japan. Educational levels of the couples are more structured among married couples: there is apparently a stronger educational homogamy among married couples who graduated from college and a propensity for women with junior college education to marry with men of college education. In other words, dating unmarried couples seem to place less emphasis on the educational level of the partner than married couples. It is, therefore, possible to speculate that education and other characteristics of the partner are taken more seriously in deciding on a marriage partner than searching for a courtship partner. Japanese people may be drawing a clear distinction in mate selection procedure between courtship and marriage

In contrast, in the United States, the same pattern of educational association characterized three types of couples: dating, cohabitation and married couples. Regardless of the types of coupling, Americans tend to take serious account of the educational level of the partner. There is a clear propensity to find partners with the same level of education at the top and the bottom of educational hierarchy. In other words, the difference between marriage mating and pre-marriage mating (cohabitation and dating) is not obvious as far as partner's educational association is concerned. Unlike Japan, marriage partnership in the United States may not be a special relationship which is clearly distinguished from courtship. Other research in the United States showed the continuous transition from pre-marital to marital stage. For example, Thornton, Axinn and Xie (2007, p.86) report that about three-fifths of young people "who had cohabited reported that they planned to marry their partner before they started to live together." Cohabitations tend to occur with clear plans for marriage. Our data also suggest a similar finding; 26 percent of our Japanese married couples had experience of cohabitation with the marriage partner prior to marriage, while 54 percent

of our American married couples did so. There is a much smoother transition from cohabitation to marriage in the United States. The difference in the pattern of educational assortative mating between pre-marital and marital couples in Japan may reflect the element of discontinuous transition from courtship and marriage.

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Figure 1A. Specification of Interaction Parameters in Design Matrix Forms ^{*1 *2}
-Japan-

Model = JP1		Unmarried Couples			Married Couples			
	Female		Male				Male	
		HS or Less	Some College	BA or More		HS or Less	Some College	BA or More
	HS or Less	1	0	0	HS or Less	4	0	0
	Some College	0	2	0	Some College	0	5	0
	BA or More	0	0	3	BA or More	0	0	6

Model = JP2		Unmarried Couples			Married Couples			
	Female		Male				Male	
		HS or Less	Some College	BA or More		HS or Less	Some College	BA or More
	HS or Less	1	0	0	HS or Less	1	0	0
	Some College	0	2	0	Some College	0	2	0
	BA or More	0	0	3	BA or More	0	0	3

Model = JP3		Unmarried Couples			Married Couples			
	Female		Male				Male	
		HS or Less	Some College	BA or More		HS or Less	Some College	BA or More
	HS or Less	1	0	0	HS or Less	3	0	0
	Some College	0	0	0	Some College	0	0	0
	BA or More	0	0	2	BA or More	0	0	4

(Figure 1A, continued)

Model = JP4		Unmarried Couples			Married Couples			
	Female	HS or Less	Male Some College	BA or More	Female	HS or Less	Male Some College	BA or More
	HS or Less	1	0	0	HS or Less	1	0	0
	Some College	0	0	0	Some College	0	0	0
	BA or More	0	0	2	BA or More	0	0	2

Model = JP5		Unmarried Couples			Married Couples			
	Female	HS or Less	Male Some College	BA or More	Female	HS or Less	Male Some College	BA or More
	HS or Less	1	0	0	HS or Less	1	0	0
	Some College	0	0	0	Some College	0	0	0
	BA or More	0	0	2	BA or More	0	0	3

Model = JP6		Unmarried Couples			Married Couples			
	Female	HS or Less	Male Some College	BA or More	Female	HS or Less	Male Some College	BA or More
*our best-fitting model	HS or Less	1	0	0	HS or Less	1	0	0
	Some College	0	0	0	Some College	0	0	4
	BA or More	0	0	2	BA or More	0	0	3

*1 Each number in a cell represents a distinctive interaction parameter within a design matrix. Cells sharing the same number are assigned the corresponding same interaction parameter within the matrix.

*2 Cells sharing zero are assigned no interaction parameters within the matrix.

Figure 1B. Specification of Interaction Parameters in Design Matrix Forms ^{*1 *2}
 -the United States-

Model = US1		Dating Couples			Cohabiting Couples				Married Couples			
		Male			Male				Male			
Female	HS or Less	Some College	College or More	Female	HS or Less	Some College	College or More	Female	HS or Less	Some College	College or More	
HS or Less	1	0	0	HS or Less	4	0	0	HS or Less	7	0	0	
Some College	0	2	0	Some College	0	5	0	Some College	0	8	0	
College or More	0	0	3	College or More	0	0	6	College or More	0	0	9	

Model = US2		Dating Couples			Cohabiting Couples				Married Couples			
		Male			Male				Male			
Female	HS or Less	Some College	College or More	Female	HS or Less	Some College	College or More	Female	HS or Less	Some College	College or More	
HS or Less	1	0	0	HS or Less	1	0	0	HS or Less	1	0	0	
Some College	0	2	0	Some College	0	2	0	Some College	0	2	0	
College or More	0	0	3	College or More	0	0	3	College or More	0	0	3	

Model = US3		Dating Couples			Cohabiting Couples				Married Couples			
		Male			Male				Male			
Female	HS or Less	Some College	College or More	Female	HS or Less	Some College	College or More	Female	HS or Less	Some College	College or More	
HS or Less	1	0	0	HS or Less	3	0	0	HS or Less	5	0	0	
Some College	0	0	0	Some College	0	0	0	Some College	0	0	0	
College or More	0	0	2	College or More	0	0	4	College or More	0	0	6	

Model = US4		Dating Couples			Cohabiting Couples				Married Couples			
		Male			Male				Male			
Female	HS or Less	Some College	College or More	Female	HS or Less	Some College	College or More	Female	HS or Less	Some College	College or More	
HS or Less	1	0	0	HS or Less	1	0	0	HS or Less	1	0	0	
Some College	0	0	0	Some College	0	0	0	Some College	0	0	0	
College or More	0	0	2	College or More	0	0	2	College or More	0	0	2	

(Figure 1B, continued)

Model = US5		Dating Couples			Cohabiting Couples				Married Couples			
	Female	Male			Male			Male			Male	
	HS or Less	Some College	College or More	Female	HS or Less	Some College	College or More	Female	HS or Less	Some College	College or More	
	HS or Less	1	0	0	HS or Less	1	0	0	HS or Less	1	0	0
	Some College	0	0	0	Some College	0	0	0	Some College	0	0	0
	College or More	0	0	1	College or More	0	0	1	College or More	0	0	1

Model = US6		Dating Couples			Cohabiting Couples				Married Couples			
	Female	Male			Male			Male			Male	
	HS or Less	Some College	College or More	Female	HS or Less	Some College	College or More	Female	HS or Less	Some College	College or More	
	HS or Less	1	0	0	HS or Less	1	0	0	HS or Less	1	0	0
	Some College	3	0	4	Some College	3	0	4	Some College	3	0	4
	College or More	0	0	2	College or More	0	0	2	College or More	0	0	2

Model = US7		Dating Couples			Cohabiting Couples				Married Couples			
	Female	Male			Male			Male			Male	
	HS or Less	Some College	College or More	Female	HS or Less	Some College	College or More	Female	HS or Less	Some College	College or More	
*our best-fitting model	HS or Less	1	0	0	HS or Less	1	0	0	HS or Less	1	0	0
	Some College	3	0	3	Some College	3	0	3	Some College	3	0	3
	College or More	0	0	2	College or More	0	0	2	College or More	0	0	2

*1 Each number in a cell represents a distinctive interaction parameter within a design matrix. Cells sharing the same number are assigned

*2 Cells sharing zero are assigned no interaction parameters within the matrix.

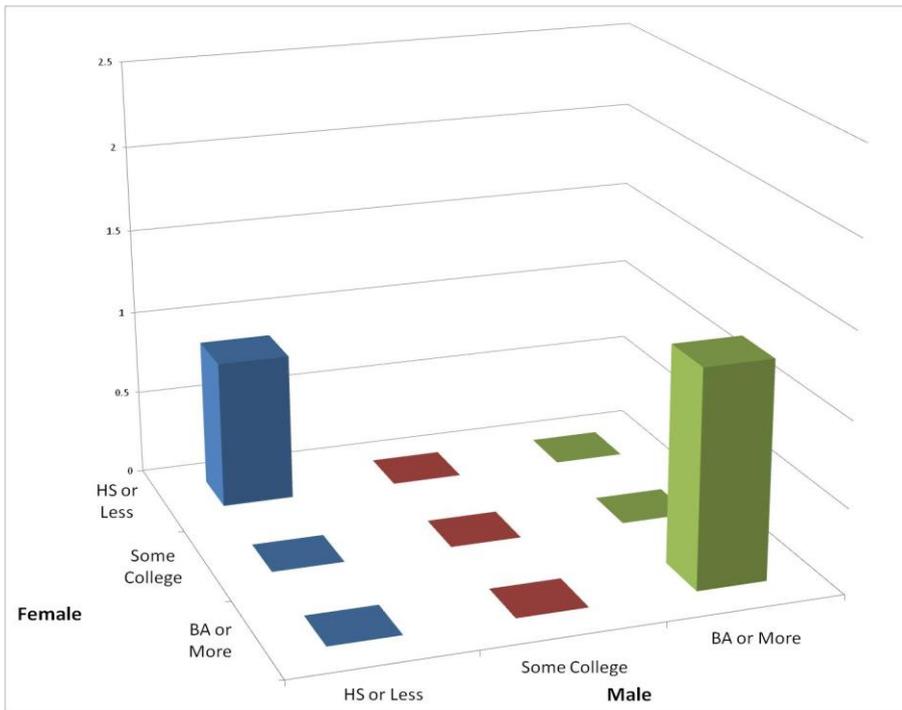


Figure 2. Pattern of Educational Assortative Mating among Unmarried Couples in Japan

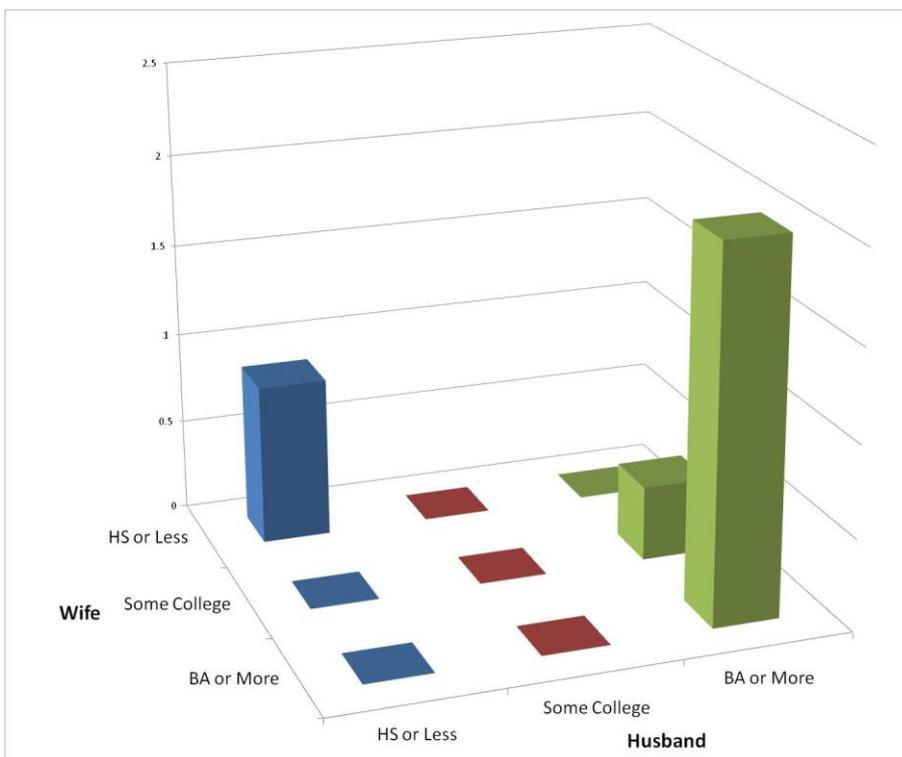


Figure 3. Pattern of Educational Assortative Mating among Married Couples in Japan

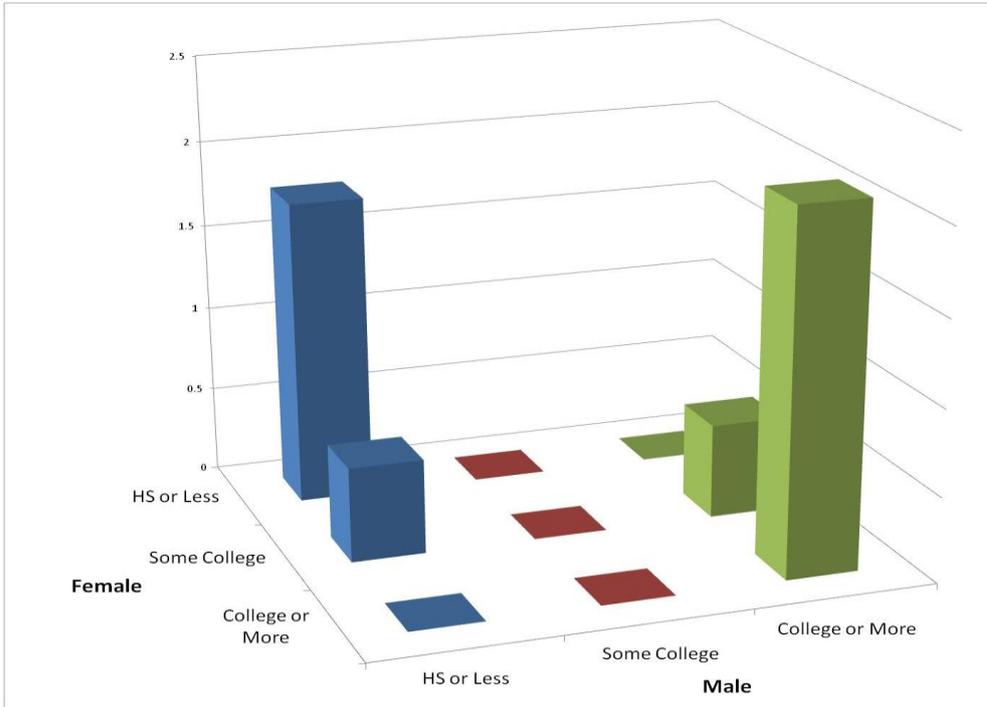


Figure 4. Pattern of Educational Assortative Mating among Couples in the United States

Table 1A. The Observed Frequencies for Educational Assortative Mating across Different Partnership Status in Japan ^{*1}

Unmarried Couples ^{*2}				Married Couples			
Female	Male			Female	Male		
	HS or Less	Some College	BA or More		HS or Less	Some College	BA or More
HS or Less	74	22	51	HS or Less	591	208	218
Some College	52	63	92	Some College	433	334	556
BA or More	31	36	202	BA or More	69	65	489

*1 The dataset for Japan is the Japanese Life Course Panel Survey.

*2 For Japanese sample, the partnership status is assumed to take either one of the two kinds of the status: the "Unmarried" or "Married".

Table 1B. The Observed Frequencies for Educational Assortative Mating across Different Partnership Status in the United States ^{*1}

Dating Couples ^{*3}				WHITE ^{*2} Cohabiting Couples				Married Couples			
Female	Male			Female	Male			Female	Male		
	HS or Less	Some College	BA or More		HS or Less	Some College	BA or More		HS or Less	Some College	BA or More
HS or Less	114.31	55.16	16.33	HS or Less	65.32	18.87	5.44	HS or Less	176.36	74.75	29.76
Some College	68.58	103.42	48.63	Some College	30.12	34.47	15.97	Some College	112.86	127.73	77.29
BA or More	20.68	55.52	111.04	BA or More	10.52	22.86	41.73	BA or More	50.44	112.49	342.92

Dating Couples				NON-WHITE Cohabiting Couples				Married Couples			
Female	Male			Female	Male			Female	Male		
	HS or Less	Some College	BA or More		HS or Less	Some College	BA or More		HS or Less	Some College	BA or More
HS or Less	257.28 ^{*4}	62.05	12.34	HS or Less	186.16	25.76	3.63	HS or Less	336.03	60.96	12.70
Some College	79.47	76.93	19.96	Some College	38.10	22.14	3.63	Some College	82.37	55.16	31.93
BA or More	18.87	31.93	38.10	BA or More	5.81	5.81	5.81	BA or More	33.39	36.29	99.79

*1 The dataset for the United States is the National Survey of Family Growth 2006-2010.

*2 The kinds of value are assigned for indicating the racial difference: "White" and "Non-White". Note that the model selection has rejected the model assuming the racial difference in educational assortative mating patterns.

*3 For the United States' sample, the partnership category is assumed to take either one of the two kinds of the status: the "Unmarried" or "Married".

*4 The cell frequency in the United States takes non-integral value because of weighting.

Table 2A. The Model Selection for Japanese Couples

MODEL	L-squared ^{*2}	D.F. ^{*3}	BIC ^{*4}
JP1	2.74	2	-13.63
JP2	14.30	5	-26.63
JP3	17.82	4	-14.92
JP4	23.06	6	-26.04
JP5	17.89	5	-23.04
JP6 *our best fitting model	5.16	4	-27.58

*1 See Figure 1A for the specification of each model

*2 L-squared stands for the Likelihood Ratio Chi-squared Statistics.

*3 D.F. stands for degree of freedom.

*4 BIC stands for Bayesian Information Criteria.

Table 2B. The Model Selection for Couples in the United States

MODEL	L-squared ^{*1}	D.F. ^{*2}	BIC ^{*3}
US1	6.83	15	-115.94
US2	9.03	21	-162.85
US3	36.76	18	-110.57
US4	38.40	22	-141.67
US5	47.28	23	-140.97
US6	8.79	20	-154.91
US7 *our best fitting model	9.03	21	-162.85

*1 See Figure 1B for the specification of each model

*2 L-squared stands for the Likelihood Ratio Chi-squared Statistics.

*3 D.F. stands for degree of freedom.

*4 BIC stands for Bayesian Information Criteria.

東京大学社会科学研究所パネル調査プロジェクトについて

労働市場の構造変動、急激な少子高齢化、グローバル化の進展などにともない、日本社会における就業、結婚、家族、教育、意識、ライフスタイルのあり方は大きく変化を遂げようとしている。これからの日本社会がどのような方向に進むのかを考える上で、現在生じている変化がどのような原因によるものなのか、あるいはどこが変化してどこが変化していないのかを明確にすることはきわめて重要である。

本プロジェクトは、こうした問題をパネル調査の手法を用いることによって、実証的に解明することを研究課題とするものである。このため社会科学研究所では、若年パネル調査、壮年パネル調査、高卒パネル調査の3つのパネル調査を実施している。

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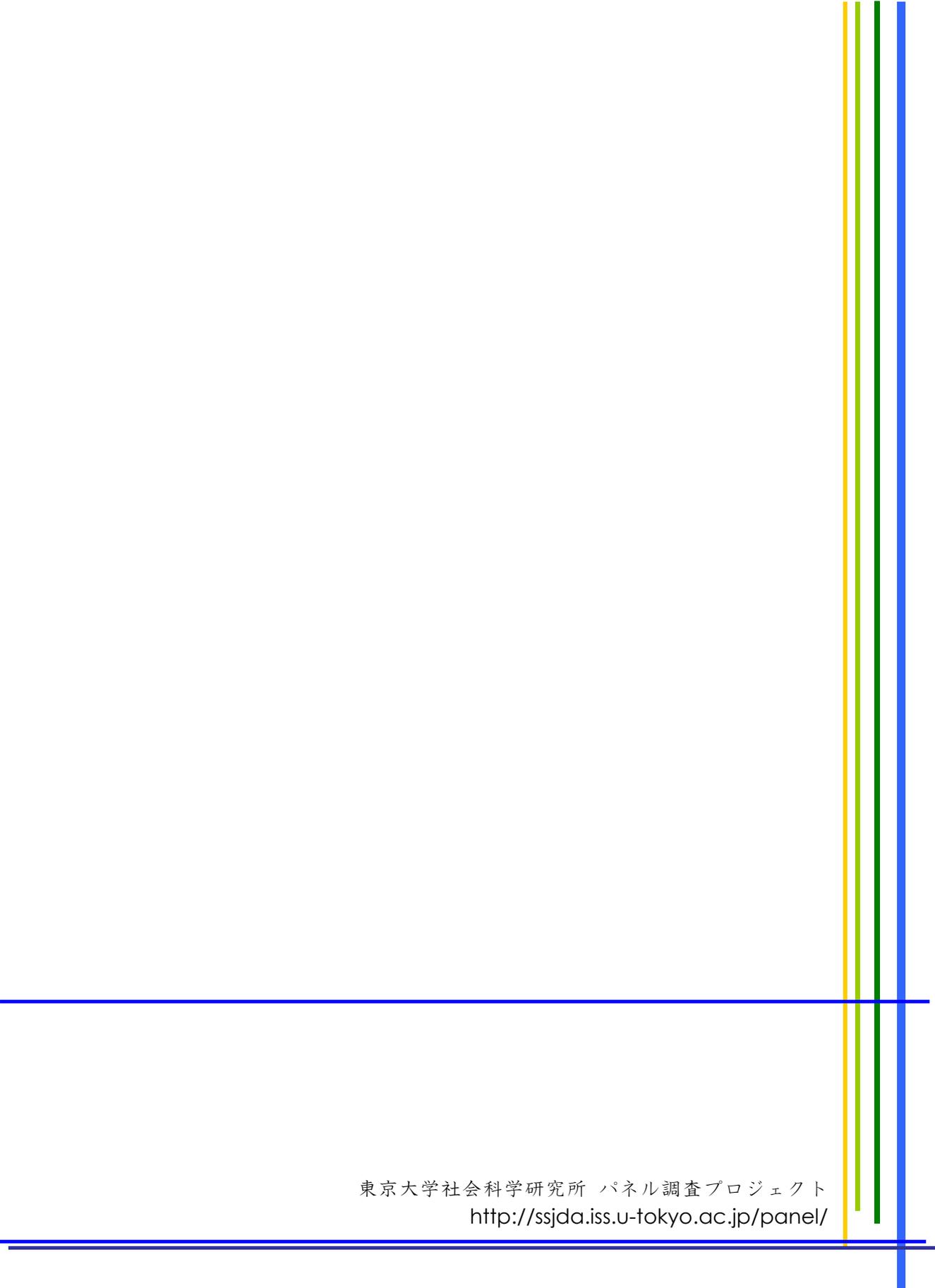
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東京大学社会科学研究所パネル調査プロジェクト ディスカッションペーパーシリーズについて

東京大学社会科学研究所パネル調査プロジェクトディスカッションペーパーシリーズは、東京大学社会科学研究所におけるパネル調査プロジェクト関連の研究成果を、速報性を重視し暫定的にまとめたものである。



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