Contingent Work Rising: Implications for the Timing of Marriage in Japan

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Abstract

Employment for young adults has become increasingly precarious in most developed countries. Many jobs provide neither benefits nor security. Employers are hiring more part-time workers. They are also hiring workers through companies that send workers for specific and time-bound periods. And many low skill jobs are being outsourced to low wage countries. These changes have made companies more nimble, and are well-documented. Less attention has been paid to the effects of these trends on the family transitions of young adults. In this paper we ask whether the experience of non-regular work leads to the postponement of marriage, and whether this effect differs for men and women. Using life history data from Japan, we find strong, significant effects for men, but, as expected in the Japanese context, no effects for women.

Introduction

[This section will note the issue, namely that in many developed countries, employment has become less secure, and will point to a possible connection to family building experiences of young adults. This takes different forms in different places, but examples include the weakened power of unions, the use of part-time workers, taking tenure from teachers, hiring workers through employment agencies, and outsourcing jobs to low wage countries. This increase precariousness of work undoubtedly impacts the family side of the life course of young adults, but has so far received relatively little attention. Using life history data from Japan, we examine the impact of experiencing contingent work on the transition to first marriage.]

Background

[This section will provide background on contingent work trends in a variety of countries.]

Setting

Growth of Non-Regular work in Japan

The percentage of non-regular workers in Japan has been increasing since the 1980s, having nearly doubled since then and now encompassing over one-third of the entire workforce, or more than twenty million workers (Osawa et al. 2013). Non-regular workers in Japan include those in part-time employment (which refers to a status, not to the number of hours typically worked) and temporary employment (which includes employees of dispatching agencies, as well as those on fixed, short-term contracts). Non-regular jobs in Japan are generally low-paid, dead-end jobs that have little job security and which provide few social protections.

The growth of non-regular employment resulted primarily from the adoption by Japanese firms of cost-reduction policies and practices designed to enhance their personnel flexibility. This was prompted by the increased competition faced by Japanese firms in the early 1990s, a situation reflected in the sharp decline of the Japanese economy in this period. The cost-cutting actions of Japanese companies were supported by political decisions to deregulate labor markets that were promoted by Prime Minister Junichiro Koizumi, following the neoliberal models of Margaret Thatcher and Ronald Reagan, which eased restrictions on the use of non-regular workers. The use of temporary workers was also encouraged by Japanese social policies that mandated social insurance only for regular workers, making it cheaper for businesses to hire non-regular workers (Yu, 2012; Osawa et al. 2013).

Along with the rise of non-regular employment was a shift in the composition of non-regular workers. While part-time workers in the 1980s consisted mainly of students and women working to supplement their family incomes (such as *arubaito*) along with men approaching retirement age, by the 1990s an increasing number of non-regular workers consisted of young and middle-aged male workers. Thus, the chances that a young man is now in irregular work are about the same as that of a married woman working part-time in 1980, reflecting what Brinton (2011: 30) calls the “de-gendering” of irregular employment in postwar Japan.

The term "freeters" has been applied to those who hold only temporary or part-time jobs and *freeters* have become a growing part of the stagnant Japanese economy. Only half of working 15-24 year-olds have regular jobs and another 10% are unemployed. In 1992, 80% of young Japanese workers had regular jobs; by 2006 half were temps. Only 2% of non-regular workers transition to regular work each year (Devine 2013).

The increase in non-regular workers in Japan is a trend in all industrial countries, as the spread of the neoliberal revolution—with its emphasis on deregulation and greater personnel flexibility—has encouraged the global expansion of precarious work: i.e., uncertain, unstable and insecure work in which employees bear the risks of work (as opposed to businesses or the government) and receive limited social benefits and statutory entitlements (Kalleberg and Hewison 2013). However, the consequences of non-regular work differ among countries, depending largely on the degree of social protections provided by a country's welfare regime. In countries that have comprehensive welfare regimes such as those in some Nordic countries, for example, the social risks of non-regular work may be relatively low. This is not the case in countries such as Japan, which is characterized by a welfare corporatist model. Here, firms provide (generally for men) long-term job security, a seniority-based wage and promotion system, and extensive benefits to ensure the wellbeing of workers and their families. In postwar Japan, laws that made it hard to fire full-time male workers supported the strong male breadwinner ideology.

The Japanese welfare corporatist system was also central to the availability of full-time jobs in workplaces, which was fundamental to the transition from full-time student to that of worker or adult in Japan, which had been relatively smooth and orderly in Japan compared to many other countries. Brinton (2011) underscores the importance of social locations (or "ba") that provide people with an identity and sense of security and notes that being attached to a stable workplace (or *ba*) was essential to the psychological as well as economic well-being of Japanese men in the postwar period.

The emergent lack of economic security among a significant portion of the Japanese labor force has had widespread repercussions, especially for young men, many of who are now marginalized as non-regular workers. Young men who can't find regular employment are unable to learn new skills, nor earn enough money to get their own place to live. Young men have been especially impacted by the disruption in life plans caused by the breakdown of orderly transitions from school to work and the paucity of orderly career lines in regular full-time employment. Brinton (2011) shows how these important structural transformations in the institutions that supported movement from school to work and into adulthood have produced a lost generation in the 1990s as a cohort of young people were unable to get a stable economic base (or *ba*) from which to transition to adulthood.

Impacts of Non-regular work on family formation

The precariousness of non-regular employment has had important effects on non-work institutions such as the family, especially in Japan with its strong tradition of the male-breadwinner, female-homemaker traditions. In particular, the rise of non-regular work in Japan has created problems for young men with regard to family formation. Not having a regular job makes a Japanese man less attractive as a potential marriage partner. Lacking such jobs, young people were not able to get settled, often living with parents until their late 20s or early 30s and putting off getting married and having children. Brinton (2011: pp. 30-1) argues that: "the sharp decline in the past fifteen years in the likelihood of young men moving into full-time jobs upon graduating from school is inextricably linked with the ever-higher average age at marriage in Japan and the very low birth rate." The low fertility rate also means that government social policies relying on a supportive family (which was formerly the *de facto* welfare system in Japan) are at odds with emerging social realities. With low wages and limited social support, the working poor are becoming entrenched in poverty.

As we will show in this paper, men who have non-regular employment relations are less likely to get married than men in regular employment. Women in non-regular employment are slightly less likely

to get married than women in regular employment, though this contrast is often not significant, which is consistent with the argument that having regular employment is less central to the life plans of women in Japan.

[In addition, this section will provide some background on trends in family behavior in Japan, including the very low proportion of births that are non-marital (2%)]

Method

Data

Data come from two sources: 1) the 2009 National Survey on Family and Economic conditions (hereafter 2009 panel), a longitudinal follow-up panel of data collected in the year 2000, and 2) a new cross-sectional survey, the 2009 National Survey of Family and Economic conditions (hereafter 2009 cross-section). The 2000 panel and 2009 cross-sectional surveys were collected using a two-stage, national probability survey of men and women aged 20-49. The first stage of sampling used geographic primary sampling units (PSUs), while the second stage used Japan's basic residence registration system. The two surveys also oversampled individuals aged 20-39, with weights used to account for oversampling as well as differential non-response by age, sex, and size and place of residence. However, because our analysis used two independent samples, each with a different set of weight variables, it was not obvious how to incorporate weighting into our analysis. Therefore, our results present only unweighted analysis.

For each survey, the mode of data collection differs from that used in the United States. Specifically, self-administered questionnaires were distributed to selected individuals and subsequently retrieved at a later date. Individuals who agreed to participate were given a token gift, and once the questionnaire was completed, it was picked up by fieldworkers. This data collection procedure has been a standard approach used in Japan since World War II, and research by Yamado and Synodinos (1994) found that self-administered surveys have a higher response rate than face-to-face interviews.

Sample

To create our analytical sample, we started with the 2009 data sets and used retrospective event history data to reconstructed individual life histories for anyone born between 1970 and 1973 (i.e., those aged 36-39 in 2009). We chose these cohorts because they were the only ones in our available data for whom we could observe life histories from a time when relatively few began to marry, until the time when many began experiencing marriage. We created a person-year data set incorporating records from all ages beginning at 15. However, data on school enrollment and work events (our main independent variable of interest) was only available from the year 1988 and thereafter, which necessitated using age 18 as the minimum for the event history analysis. We also conducted sensitivity analysis incorporating time lags, which further reducing our number of available person-years to those beginning at age 20.

Measures

Marriage, our dependent variable, is measured as a dichotomous variable equal to '1' in the year that a respondent reported experiencing their first marriage, and zero otherwise. To capture our main independent variable of interest, we combined work and school enrollment status into a series of time-varying dummy variables for whether, in a given person-year, the respondent experienced: 1) no work or school events, 2) a regular work event, 3) a non-regular work event, and 4) a school enrollment event. We created these measures from retrospective data that inquired about the respondents' life events going back to the year 1988, which distinguished between whether or not the event was experienced and if so, the starting and ending year.

While numerous events could have occurred in a single person-year, overlaps were numerically rare. Consequently, we chose to group overlapping events into a set of mutually exclusive categories to avoid estimation problems in our models. We dealt with any event overlaps according to the following logic. From the perspective of marriage, having a regular job makes men more attractive in the marriage

market, and may make women hesitant to give up their positions. We consider other states (i.e., non-regular work and schooling) as supplementary, as they provide merely extra income or further human capital accumulation (perhaps in the form of technical schooling). Thus, we viewed regular work events as trumping these other states. For overlaps involving non-regular work and schooling, we coded these as school enrollment events, because such individuals are probably working part-time to help pay their way through school.

We also used a measure of school attainment, which we also measured as time-varying. While retrospective data on attainment are lacking in the data set, we nonetheless reconstructed individuals' education according to a combination of their reported highest level of attainment in 2009, their yearly enrollment measures, and outside information on the typical pattern of school attainment by age in the Japanese system. While not completely accurate, we feel that this approach is justified, because the Japanese education system is rather unforgiving (exits generally do not involve future returns), forcing students to stay on track. Furthermore, non-traditional educational trajectories, in which people return to school following a paid employment episode, tend not to occur in Japan like they do in the United States. Japanese students attend senior high between the ages of 15 and 18; thus, unless an individual's highest level of education was reported as junior high school, senior high was assigned to these person-years[1]. In subsequent person-years, the highest reported level of education was assigned. Dummy variables used to measure school attainment include: 1) junior high school, 2) senior high school, 3) technical training school, 4) junior college or advanced technical school, 5) and university education or higher.

[1] One adjustment was made to each respondent's education timing. In Japan, children experiencing their sixth birthday on or before April 1st enter the first grade that calendar year, and hence finish the twelfth grade at age 17, instead of 18. Thus, using information on the respondent's data of birth, we assigned those entering the system early with the appropriate level of education for their age.

A measure of age was matched to a particular person-year using each respondent's reported year of birth. We use age to capture the baseline hazard of marriage, and included an age squared term to model a curvilinear age effect. In like fashion, information on birth year was also used to create a series of dummy variables measuring the respondent's birth cohort, 1970-1973. We also included measures of cohabitation and migration. Cohabitation is a time-varying dummy variable equal to '1' in years the respondent reported cohabiting, and zero otherwise. It is based on survey data for the year of occurrence of a cohabitation event, for up to two cohabitation episodes. Migration is also a dummy variable, measuring changes in residence across prefectures in adjacent person-years. Such changes were recorded in the data starting from the time the respondent was 15 years old, and included up to six moves. We also incorporated a dummy variable for whether the data originated from the 2009 panel or 2009 cross-sectional data.

Analytical Approach

We use discrete-time event history analysis to model the determinants of the hazard of first marriage. The pooling of person-years results in a number of units that is much higher than the original number of individuals in the data set. However, using pooled person-year data produces results comparable to a continuous time approach, while enabling the incorporation of time-varying covariates (Allison 1982, 1984). Our model uses a probit specification and adjusts standard errors using a heteroskedastic robust procedure (White 1980). Individuals contribute person-year records until they experience a first marriage event or are censored at the time of the survey in 2009. We conduct separate analysis for men and women.

Results

We begin with results from nuptiality table estimates (*available on request*) for all person-years from age 15 and up, presented in Figure 1 as a survival curve of singlehood. The figure shows that the marriage pattern differs somewhat for men and women. For the former, marriage first begins around

age 18, but is most prevalent in the early 20s until about age 35. The survival curve is similar for women, but it is evident that marriage occurs at younger ages and the pattern diverges from that of men by the early 20s. Overall, fewer women remain single, and by their 30s, only a minority are still single.

[Figure 1 about here]

Table 1 shows descriptive statistics for all variables used in the analysis, presented separately for men and women. Marriage events are slightly more prevalent among women, compared to men, but the differences are slight (8 percent vs. 6 percent, respectively). Our main results incorporate a two-year lag for measures of work/school events. Regular work states are the most prevalent for both men and women (accounting for two-thirds of men's person-year records, and nearly as many for women). School enrollment is the next most prevalent state, accounting for just under a quarter of event states for both men and women, respectively. The next most common state is non-regular work, which accounts for 11 percent of women's person-years, and only 7 percent of men's. States associated with no work/school events make up the remaining portion of the distribution, and are relatively non-prevalent for both men and women (about 4 percent, of each respective distribution).

[Table 1 about here]

In terms of the distribution of school attainment, senior high school is the most prevalent event state, making up over a third of all person-years for men and women, respectively. The next most common educational attainment levels differed noticeably for men and women, with men having a substantially higher… [the remainder of descriptive statistics will be discussed here]

[The discussion of table 2 will focus on the work status variable, which is lagged 2 years behind the year in which the marriage could occur. The 2 year lag is our preferred lag because it allows time for a marriage decision to be made and to plan a wedding. The results are exactly as expected. Having a non-regular job significantly lowers the likelihood of men marrying but has no effect on women in the Japanese context where women are expected to quit work upon marriage. For men, being out of the

labor force or being in school also postpones marriage. For women, only being in school postpones marriage]

[The discussion of table 3 will talk about the different lags. The results for men are quite robust across different lags. For women, having a lag of 0 years shows a positive effect of not being in the labor force on the likelihood of marriage. This is clearly incorrect and reflects the fact that women getting married are simultaneously quitting their jobs – in short endogeneity. And in general, the female results are weak as would be theoretically expected.]

[This section will end by discussing the various sensitivity tests conducted and shown in the appendix.]

Conclusions

[The conclusion will include a summary, a discussion of other family transitions, and speculation on whether we would find these results in Europe and North America.]

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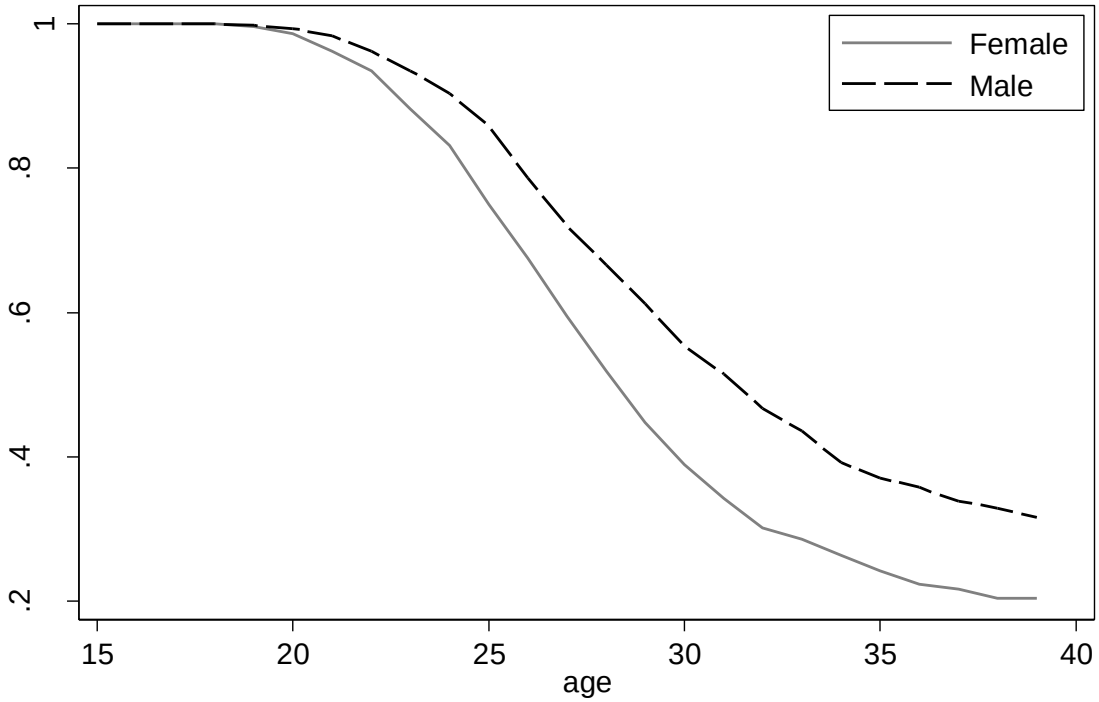
Figure 1. Survival Curves for First Marriage, by Sex



N = 7947 Men & 7602 Women

Table 1. Descriptive Statistics, 1970-1973 Cohorts

	Females		Males	
Variable	**Mean**	**SD**	**Mean**	**SD**
Marriage	0.08	0.28	0.06	0.24
Work/School Status (2-Year Lag)				
No Work/School Events	0.04	0.19	0.04	0.20
Regular Work	0.62	0.48	0.66	0.47
Non-Regular Work	0.11	0.32	0.07	0.25
School Enrollment	0.23	0.42	0.23	0.42
School Attainment				
Junior High School	0.03	0.18	0.07	0.25
Senior High School	0.37	0.48	0.38	0.49
Technical Training School	0.14	0.34	0.16	0.37
Junior College/ Adv Technical	0.28	0.45	0.05	0.22
University or Higher	0.18	0.39	0.34	0.47
Age	25.91	4.79	26.74	5.02
Cohabited	0.02	0.12	0.01	0.12
Birth Cohort				
1970	0.25	0.43	0.25	0.43
1971	0.25	0.43	0.28	0.45
1972	0.26	0.44	0.22	0.41
1973	0.24	0.43	0.25	0.43
Migration	0.04	0.19	0.04	0.19
Sample (2009 Cross-Section = 1)	0.63	0.48	0.66	0.47
Number of Person-Years	4,924		5,485	

Table 2. Discrete Time Probit Estimates of Hazard of First Marriage, by Sex				
	Females		Males	
Variable	**Coeff**	**StdErr**	**Coeff**	**StdErr**
Intercept	-2.83***	0.29	-2.82***	0.32
Work/School Status (2-Year Lag)				
No Work/School Events	-0.23	0.16	-0.60**	0.21
(Regular Work)	--	--	--	--
Non-Regular Work	-0.17	0.087	-0.54***	0.14
School Enrollment	-0.53***	0.11	-0.81***	0.13
School Attainment				
Junior High School	-0.27	0.18	-0.18	0.13
(Senior High School)	--	--	--	--
Technical Training School	-0.11	0.088	-0.15	0.089
Junior College/ Adv Technical	-0.18**	0.069	0.09	0.12
University or Higher	-0.16*	0.083	0.0041	0.073
Age	0.064***	0.011	0.055***	0.012
Age Squared	-0.0095***	0.0014	-0.0066***	0.0014
Cohabited	0.40*	0.19	0.56**	0.19
Birth Cohort				
(1970)	--	--	--	--
1971	-0.069	0.078	0.059	0.078
1972	0.0072	0.075	-0.11	0.086
1973	0.028	0.078	-0.0098	0.083
Migration	0.72***	0.11	0.30*	0.15
Sample (2009 Cross-Section = 1)	0.17**	0.06	0.13*	0.062
Number of Person-Years	4,924		5,485	
-2LL	2604.20		2261.2	
* p<0.05, ** p<0.01, *** p<0.001				

Table 3. Work Status Coefficients from Discrete-Time Probit Estimates of the Hazard of First Marriage, by Sex, lags 0-5 years, (Standard Errors Below Coefficients)

	Men			Women		
Lag (Years)	No Work /School Events	Non-Regular Work	School Enrollment	No Work/School Events	Non-Regular Work	School Enrollment
0	-0.62**	-0.89***	-0.72*	0.57***	-0.045	-0.036
	0.21	0.19	0.28	0.11	0.083	0.26
1	-0.72**	-0.73***	-0.76***	-0.2	-0.20*	-0.33
	0.24	0.17	0.21	0.15	0.087	0.21
2	-0.70**	-0.55***	-0.75***	-0.39*	-0.17	-0.37*
	0.24	0.15	0.16	0.18	0.09	0.16
3	-0.70**	-0.54***	-0.48***	-0.49*	-0.20*	-0.40**
	0.24	0.15	0.12	0.19	0.095	0.13
4	-0.56**	-0.57***	-0.33**	-0.29	-0.2	-0.34**
	0.22	0.16	0.1	0.18	0.1	0.11
5	-0.67**	-0.62***	-0.22*	-0.18	-0.21	-0.22*
	0.24	0.16	0.1	0.18	0.11	0.1
N	4117			3452		

Note: [1] Regular work is the omitted Category

Table A1. Discrete Time Probit Estimates of Hazard of First Marriage, by Sex (Sensitivity Analysis Cohabitation and Migration Variables)

	Females						Males					
	Model 1		Model 2		Model 3		Model 1		Model 2		Model 3	
Variable	**Coeff**	**StdErr**	**Coeff**	**StdErr**	**Coeff**	**StdErr**	**Coeff**	**StdErr**	**Coeff**	**StdErr**	**Coeff**	**StdErr**
Intercept	-2.81***	0.29	-2.82***	0.29	-2.83***	0.29	-2.78***	0.32	-2.80***	0.33	-2.82***	0.32
Work/School Status (2-Year Lag)												
No Work/School Events	-0.25	0.16	-0.24	0.16	-0.23	0.16	-0.61**	0.21	-0.61**	0.21	-0.60**	0.21
(Regular Work)	--	--	--	--	--	--	--	--	--	--	--	--
Non-Regular Work	-0.17*	0.086	-0.17	0.086	-0.17	0.087	-0.52***	0.14	-0.52***	0.14	-0.54***	0.14
School Enrollment	-0.50***	0.11	-0.52***	0.11	-0.53***	0.11	-0.79***	0.13	-0.81***	0.13	-0.81***	0.13
School Attainment												
Junior High School	-0.27	0.18	-0.27	0.18	-0.27	0.18	-0.17	0.13	-0.17	0.13	-0.18	0.13
(Senior High School)	--	--	--	--	--	--	--	--	--	--	--	--
Technical Training School	-0.1	0.087	-0.11	0.088	-0.11	0.088	-0.14	0.089	-0.15	0.089	-0.15	0.089
Junior College/ Adv Technical	-0.16*	0.068	-0.18**	0.069	-0.18**	0.069	0.12	0.12	0.11	0.12	0.09	0.12
University or Higher	-0.12	0.083	-0.17*	0.084	-0.16*	0.083	0.0085	0.072	-0.001	0.073	0.0041	0.073
Age	0.064***	0.011	0.064***	0.011	0.064***	0.011	0.054***	0.012	0.054***	0.012	0.055***	0.012
Age Squared	-0.0097***	0.0014	-0.0094***	0.0014	-0.0095***	0.0014	-0.0066***	0.0014	-0.0066***	0.0014	-0.0066***	0.0014
Cohabited	--	--	--	--	0.40*	0.19	--	--	--	--	0.56**	0.19
Birth Cohort												
(1970)	--	--	--	--	--	--	--	--	--	--	--	--
1971	-0.062	0.078	-0.068	0.078	-0.069	0.078	0.074	0.078	0.07	0.078	0.059	0.078
1972	0.0016	0.074	0.0052	0.075	0.0072	0.075	-0.1	0.085	-0.1	0.085	-0.11	0.086
1973	0.038	0.077	0.035	0.078	0.028	0.078	-0.012	0.082	-0.0072	0.082	-0.0098	0.083
Migration	--	--	0.74***	0.11	0.72***	0.11	--	--	0.32*	0.15	0.30*	0.15
Sample (2009 Cross-Section = 1)	-2.81***	0.29	-2.82***	0.29	-2.83***	0.29	-2.78***	0.32	-2.80***	0.33	-2.82***	0.32
Number of Person-Years	4,924		4,924		4,924		5,485		5,485		5,485	
-2LL	2649.8		2609.2		2604.2		2274.4		2270		2261.2	

* p<0.05, ** p<0.01, *** p<0.001

Note: Model 1 is the baseline model, Model 2 adds Migration, Model 3 adds Cohabitation

Table A2. Likelihood Ratio Tests for Models Interacting Sample Indicator (i.e., Cross-Section vs. Panel) and Variable Main Effects

	Females				Males			
Model (Var Tested)	**Log Likelihood**	**df**	**LR Test Statistic**	**p-value**	**Log Likelihood**	**df**	**LR Test Statistic**	**p-value**
Baseline[a]	-1302.1153	--	--	--	-1130.5551	--	--	--
Work/School Status (2-Year Lag)	-1299.7883	3	4.65	0.20	-1129.0218	3	3.07	0.38
School Attainment	-1299.4843	4	5.26	0.26	-1130.3225	4	0.47	0.98
Age & Age Squared	-1298.0093	2	8.21	**0.02**	-1126.5986	2	7.91	**0.02**
Cohabited	-1302.0497	1	0.13	0.72	-1130.0309	1	1.05	0.31
Birth Cohort	-1299.0617	3	6.11	0.11	-1129.5873	3	1.94	0.59
Migration	-1301.6263	1	0.98	0.32	-1130.5415	1	0.03	0.87
All Variables	-1291.3801	14	21.47	0.09	-1121.3957	14	18.32	0.19

Note: [a]Model includes main effect of all variables; all subsequent models tested against this one

Table A3. Sensitivity Analysis, Interactive Effect of Data Set (Cross-section vs. Panel) and Age and Age Square

	Females		Males	
Variable	**Coeff**	**StdErr**	**Coeff**	**StdErr**
Intercept	-1.95***	0.43	-2.43***	0.5
Work/School Status (2-Year Lag)				
No Work/School Events	-0.23	0.16	-0.62**	0.21
(Regular Work)	--	--	--	--
Non-Regular Work	-0.18*	0.087	-0.53***	0.14
School Enrollment	-0.53***	0.11	-0.79***	0.13
School Attainment				
Junior High School	-0.25	0.18	-0.18	0.13
(Senior High School)	--	--	--	--
Technical Training School	-0.11	0.087	-0.16	0.09
Junior College/ Adv Technical	-0.18**	0.07	0.089	0.12
University or Higher	-0.16	0.086	-0.0051	0.073
Age	0.03	0.017	0.043*	0.02
Age Squared	-0.0075**	0.0023	-0.0088***	0.0026
Cohabited	0.40*	0.18	0.54**	0.18
Birth Cohort				
(1970)	--	--	--	--
1971	-0.085	0.078	0.065	0.078
1972	0.0093	0.075	-0.11	0.087
1973	0.022	0.078	-0.0078	0.082
Migration	0.72***	0.11	0.30*	0.15
Sample (2009 Cross-Section = 1)	-1.14*	0.49	-0.5	0.6
Interactions				
Sample × Age	0.051*	0.02	0.02	0.023
Sample × Age Square	-0.0028	0.0028	0.0028	0.003
Number of Person-Years	4,924		5,485	
-2LL	2596		2253.2	

* p<0.05, ** p<0.01, *** p<0.001

Note: For Both Male and Female Subsamples, Major Collinearity Problems between the Main Effect of Sample and the Interactive Effect of Sample and Age