Partner choice and mortality in Sweden (extended abstract)

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Introduction

The research on native-immigrant marriage has become one of the classical topics of the European migration literature in the recent years, mainly due to a widespread view that ćintermarriage is an important indicator and agent of social integration of minorities. Echoing the belief that intermarried migrants are particularly well integrated into host societies, migration researchers have also been interested in the link between partner choice and long-term socio-economic outcomes. These studies were initially mainly concerned with economic outcomes, such employment or earnings. This field has gradually broadened, and more recently we can observe an increased interest in the association between partner choice and health. Our aim is to contribute to this emerging research area by exploring the link between exogamy and mortality among natives and immigrants in Sweden. The contribution to the literature is also reflected in the fact that this is the first study in this field based on total population data. Another important novelty is that we do not only include individuals who currently live in a union, but also those who have experienced a separation or divorce.

Marriage and health

There exists a considerable body of research on the link between marriage and health, and most studies show a positive association between the two. To some extent, this result may be an outcome of a selection process – healthier individuals are more likely to marry (Waldron et al., 1996). However, prior research suggests that this association cannot be entirely explained by selection, meaning that there is some causal impact of marriage on health as well. Social control is one of the channels through which this impact is achieved. In particular, marital partners often act as agents of social control by reminding or even threatening each other in order to influence health behaviours (Carr and Springer, 2010; Dailey et al., 2011). The effects of partner's control are stronger for men, since women practice fewer unhealthy behaviors and are more vigilant monitors (Duncan et al., 2006). Interdependence theory, stemming from social psychology, offers additional explanations of the benefits of marriage on health (Rusbult and Van Lange, 2003). According to this perspective, each partner's health is affected by his or her actions as well as by the actions of his or her spouse, which Lewis et al. (2006) refer to as mutual joint effects. Lewis and colleagues also argue that the behaviour of couple's members after the union formation changes from being self-centered to the one that is more couple-centered and health enhancing. This transformation of motivation is believed to be a key mechanism that may explain how interdependence arises within couples. And indeed, the empirical evidence confirms a strong correspondence between partners' health and health practices (Wilson, 2002; DiMatteo, 2004; Monden, 2007). However, although interdependence theory emerged to explain the benefits of marriage for health, the nature of the underlying

mechanisms suggests that not all marriages affect partners' health equally. First of all, marital quality is an important factor determining whether and to what extent marriage is linked with better health outcomes (Kiecolt-Glaser and Newton, 2001; Robles et al., 2014). Moreover, partners can curb each other's negative health behaviors, so that marriage, under certain circumstances, can have a negative impact on health (Meyler et al., 2007; Springer and Carr, 2010).

Health behaviors and outcomes in Sweden

With life expectancy being 81 years for men, and 84 years for women, Sweden ranks among the countries with the highest life expectancy in the world. The studies consistently show that native population in Sweden reports better health than immigrants (Solé-Auró, A., & Crimmins, 2008; OECD, 2012). However, once we turn towards objective health indicators, the patterns of native-immigrants differentials in health and mortality become much more complex. Albin et al. (2005) focus on the period between 1970 and 1999, and find that mortality was higher among immigrants than native Swedes during this period. In contrast, looking at the period between 1990 and 2008, Johansson et al. (2012) find that immigrants, with the exception of Nordic immigrants, had lower mortality than natives. Rostila and Fritzell (2014) indicates that mortality among the foreign-born in Sweden varies substantially across migrant groups. Finnish immigrants have the highest mortality, followed by other Nordic immigrants. The healthy immigrant effect is primarily found among non-European groups, as most of these groups have considerably lower mortality risk than natives. In another Swedish study, Oksuzyan et al. (2019) find that the link between an affiliation to an immigrant group and relative mortality risk is moderated by gender. In immigrant groups with mortality rates higher than among natives, is particularly pronounced among men. In immigrant groups with a survival advantage, the magnitude of the advantage is similar for both sexes.

Turning to differences in health behaviors, Gadd et al. (2005) as well as Nystedt (2006) find that immigrant men smoke more than Swedish men, while no such differences are found for women. Immigrants have higher BMIs and engage in less physical activity than Swedes (Wändell, 2004; Nystedt, 2006; Solé-Auró, A., & Crimmins, 2008). Finnish immigrants drink more alcohol than natives, while the alcohol consumption in other groups is similar or lower to that among natives (Hjern and Allebeck, 2004). Svensson and Hagquist (2010) find that the consumption of illicit drugs is higher among immigrants. Taken together, it can be argued that, on average, natives practice somewhat healthier lifestyles than immigrants.

Intermarriage and mortality – theory and expectations

Intermarriage is not only considered an indicator of social integration, but is also celebrated as an agent of social interaction between different groups (Kalmijn, 1998). This enthusiasm is being tempered somewhat in the light of the empirical evidence that, as compared to endogamous marriages, mixed marriages are characterized by a lower marital quality (Hohmann-Marriott and Amato, 2008). This is usually ascribed to the fact that mixed couples are exposed to more potential relationship stressors. For instance, partners of different origins may have very different views on very important aspects of everyday life, such as childrearing practices or gender roles (Bustamante et al., 2011). Moreover, mixed couples may also be disadvantaged when it comes to the social support and some researchers maintain that mixed couples may feel stigmatized and more often isolated than endogamous couples (Miller and Kail, 2016). It may thus not be surprising that it is an almost universal finding in the European and American literature that unions of partners of different origins are also more likely to dissolve than

endogamous marriages. This is the case regardless of the dimension of social affiliation (i.e. nativity, ethnicity, religion or race) that defines an intermarriage. Dribe and Lundh (2012) find that native-immigrants unions in Sweden are more likely to break up than endogamous unions, whereby the risk of separation and divorce increases with the cultural distance between Sweden and the country of origin of the non-Swedish partner. Similar to the patterns of the formation of mixed unions, the mechanisms of their dissolution are also gendered in Sweden – native man / immigrant woman unions are more stable than immigrant man / native woman unions (Dribe and Lundh, 2012). Moreover, immigrant women who do experience a breakup of a mixed union will typically choose a native partner also the next time around, which is not the case among immigrant men (Obućina, 2016). In summary, the empirical evidence suggests the overall experience of intermarriage in Sweden is somewhat more favorable for immigrant women and native men. Given the considerations presented in this section, our *marital distress hypothesis* predicts that intermarried partners will have a higher mortality risk than immigrants and natives living in endogamous unions. We also expect the mortality risk to be particularly pronounced in immigrant man / native woman unions.

As discussed, the intedependence theory holds that there is a diffusion of both good and bad health behaviors within couples. This may result in a convergence of health behaviors over time, and would imply that health behaviors of mixed couples will be somewhere in- between those in endogamous immigrant couples and those in endogamous native couples. In the light of the evidence that health behaviors are on average more favorable among natives, the *convergence hypothesis* states that the mutual joint effects should lead to a lower risk of mortality for intermarried immigrants, as compared to their co-ethnics who live in an endogamous union. At the same time, the same mechanisms should contribute to a higher mortality risk for intermarried natives, relative to natives living in endogamous unions.

The mechanisms behind the two hypotheses are not mutually exclusive. They should lead to the same results among natives, whereas among immigrants they work in the opposite directions. Nevertheless, both hypotheses assume that it is typical immigrants and typical natives that form mixed couples. However, it is likely that the patterns the formation of mixed couples in Sweden (as well as elsewhere, see Giuntella, 2016) are also shaped by selection on unobservable characteristics. The status exchange hypothesis views ethnicity as a status marker on the marriage market and posits that mixed nativity marriages thus emerge as outcomes of a process of exchange of socioeconomic status of a higher- educated immigrant partner for the ethnic status of a lower-educated native partner (Fu, 2001; Kalmijn, 2010). However, there is some evidence that status exchange processes in partner selection may also operate based on age and health (Gonzalez-Ferrer et al., 2018; Lykke and Rendall, 2018), whereby younger and healthier immigrants are more likely to form mixed couples. It is difficult to estimate the relevance of the possible health selection for the formation of mixed couples in Sweden, but this mechanism should be taken into account when interpreting the findings of this study.

The role of divorce

It is a common finding in the literature that that marriage is positively associated with health, and the the married live longer (Drefahl, 2012). It is, however, less clear to what extent this association is shaped by the protective role of marriage, and to what degree it is a result of selection into marriage. On the other hand, it has been established that divorce can have negative effects on health and increase the likelihood of mortality (see Hemström, 1996, for Sweden). As discussed in Dupre et al. (2009), marital dissolutions can have immediate negative consequences for health, such as stress and acute changes in emotional well-being. Long-term

negative consequences can emerge as a result of loneliness, but also due to reduced financial resources (Wyke and Ford, 1992). Further, all these factors can bring about unhealthy lifestyles that precipitate chronic diseases and mortality.

Building on this literature, and assuming that marital dynamics in intermarriages differs from that in endogamous marriages, we want to explore whether and to what degree the mortality among divorced depends on the type of the previous marriage. This part of the analysis is mainly exploratory, and we do not propose explicit hypotheses.

Data and methodology

We apply a longitudinal approach, using Swedish population registers and hazard regression/event-history techniques to examine the role of intermarriage on all-cause mortality. The baseline hazard $h_l(t)$ is modeled as a function of age using the Cox proportional hazard model. The Cox proportional hazard model is a flexible semi-parametric that makes no assumption of the shape of the baseline hazard but allows us to accurately estimate the direction and magnitude of the effects of observed covariates on the risk of dying.

The data come from the AgeingWell collection of registers, administered by the Stockholm University Demography Unit. Swedish population registers are a source of detailed and highly accurate demographic information with a very low percentage of missing data. The information analyzed for every individual comprises histories of vital demographic events, such as those of migration and death, which are covered with the accuracy of a day. The analyses also include a variety of background information such as gender, country of birth (time-constant) and time-varying histories of household income, unemployment status, marital status and educational attainment.

The base population of our study consists of all people aged 18 and older who were ever married and living in Sweden at the beginning of 1990. The first year of follow-up is 1990, as this is the earliest year for which we have annual background data on educational attainment and income. New individuals enter the study in the following ways: a) an unmarried individual aged 18 or above marries during 1990-2016; b) a married individual aged 18 or above immigrates to Sweden during 1990-2016; c) a married individual turns 18 during 1990-2016. All individuals are followed until death, censoring due to emigration, or December 31, 2016, whichever comes first. Individuals are right-censored at any emigration from Sweden but can re-enter the study population when they re-immigrate to Sweden during follow-up.

The main variable of interest is a categorical variable that combines the origin of the index person (ego) and his or her partner. In the initial analysis, the results of which are enclosed with this abstract, we distinguish between the following categories: S-S (Swedish ego, Swedish spouse), F-S (foreign-born ego, Swedish spouse), F-F exogamous (foreign-born ego, foreign-born non-co-ethnic spouse), F-F endogamous (foreign-born ego, foreign-born co-ethnic spouse), and S-F (Swedish ego, foreign-born spouse). We control for a number of socio-demographic characteristics. Information on educational attainment, household income, and unemployment are recorded annually. Information on educational attainment is grouped into two categories. The lower categories corresponds to individuals who completed primary school, lower secondary school, or higher secondary school (ISCED 0-3). The higher category corresponds to individuals with any post-secondary education (ISCED 4-7). Information on household income is grouped into terciles each year. Information on unemployment is included as a dummy variable, which is coded 1 during a specific year if an individual received any

unemployment benefits during that year, and 0 otherwise. Information on marital status is recorded with daily precision and is grouped into married, separated, and widowed. We also include an indicator variable for persons with at least one child below the age of 18.

Preliminary results

The results for men are shown in Table 1 (at the end of the abstract). Controlling for family status, education and income, native men with an experience of intermarriage have a 14 percent higher mortality risk, as compared to men with no such experience. Concerning foreign-born men, they face somewhat higher mortality risk in general, but the association between exogamy and mortality risk is less straightforward. As compared to immigrant men who live or have lived in an endogamous marriage, the foreign-born men with an experience of intermarriage with a non-co-ethnic immigrant woman have an elevated mortality risk. However, the experience of intermarriage with a native woman is associated with a slightly lower mortality risk. Overall, the impact of partner choice for mortality for men is non-negligible, but less pronounced than the impact of family status or socio- economic position.

In contrast, after controlling for other observables, we find very little evidence that the partner choice affects mortality risk among women. As shown in Table 2 (at the end of the abstract), even when the coefficients are statistically significant, the magnitude of the associations remains small. To illustrate, an experience of a native-immigrant union increases the mortality risk for both native and immigrant women for less than 2 percent. Interestingly, our analysis indicates that not only partner choice, but also marital status as such has a weaker impact on mortality that is the case among men.

Next steps

In the upcoming weeks, the paper will be enriched by the following additional analyses:

1. We will add a separate analysis of married and divorced individuals with the goal to explore the link between the type of the failed marriage and mortality.

2. The current analysis most likely masks a substantial heterogeneity among migrant groups in Sweden. An additional analysis will be based on more complex interactions between intermarriage and immigrants' origin.

3. Additional contextual covariates will be added to all the multivariate models in the paper. Most importantly, in order to take into account a possible impact of third parties on mixed marriages, we will control for the presence of own and other immigrants groups in the neighborhood of residence.

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Table 1: Results for men

	(1)	(2)	(3)
	analysis time when record ends	analysis time when record ends	analysis time when record ends
S-S	1.000	1.000	1.000
	[1.000,1.000]	[1.000,1.000]	[1.000,1.000]
F-S	0.998	1.008	1.044***
	[0.981,1.015]	[0.991,1.024]	[1.027,1.062]
F-F exogamous	0.879***	1.180***	1.127***
	[0.870,0.889]	[1.166,1.194]	[1.114,1.140]
F-F endogamous	1.141***	1.082***	1.079***
	[1.123,1.159]	[1.065,1.099]	[1.062,1.097]
S-F	0.890***	1.245***	1.136***
	[0.886,0.894]	[1.237,1.254]	[1.128,1.144]
Married		1.000	1.000
		[1.000,1.000]	[1.000,1.000]
Divorced		1.681***	1.440***
		[1.668,1.694]	[1.428,1.452]
Widowed		1.533***	1.291***
		[1.521,1.545]	[1.280,1.302]
Primary or sec. educ.			1.000
			[1.000,1.000]
Post-secondary educ.			0.797***
			[0.791,0.802]
Education missing			0.990**
			[0.983,0.997]
Lowest income tercile			1.175***
			[1.169,1.181]
Middle income tercile			1.000
			[1.000,1.000]
Highest income tercile			0.769***
			[0.763,0.775]
Unemployed			0.968**
			[0.946,0.990]
Has a child below 18			0.792***
			[0.778,0.806]
Observations	17555770	17555770	17401154
N_fail	932613.000	932613.000	898136.000
risk	1.850e+10	1.850e+10	1.847e+10

Exponentiated coefficients; 95% confidence intervals in brackets
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 2: Results for women

	(1)	(2)	(3)
	analysis time when record ends	analysis time when record ends	analysis time when record ends
S-S	1.000	1.000	1.000
	[1.000,1.000]	[1.000,1.000]	[1.000,1.000]
F-S	0.983**	0.981**	1.015*
	[0.971,0.995]	[0.970,0.993]	[1.003,1.028]
F-F exogamous	0.823***	1.018*	0.987
	[0.812,0.834]	[1.004,1.033]	[0.973,1.002]
F-F endogamous	1.008	0.984*	0.996
	[0.993,1.022]	[0.970,0.998]	[0.982,1.010]
S-F	0.841***	1.095***	1.014**
	[0.837,0.846]	[1.086,1.105]	[1.005,1.024]
Married		1.000	1.000
		[1.000,1.000]	[1.000,1.000]
Divorced		1.442***	1.293***
		[1.428,1.456]	[1.279,1.307]
Widowed		1.373***	1.189***
		[1.361,1.386]	[1.177,1.201]
Primary or sec. educ.			1.000
			[1.000,1.000]
Post-sec. education			0.716***
			[0.710,0.723]
Education missing			1.020***
			[1.014,1.026]
Lowest income tercile			1.101***
			[1.094,1.108]
Middle income tercile			1.000
			[1.000,1.000]
Highest income tercile			0.805***
			[0.796,0.813]
Unemployed			0.741***
			[0.719,0.763]
Has a child below 18			0.711***
			[0.692,0.730]
Observations	20210084	20210084	20062281
N_fail	950625.000	950625.000	922999.000
risk	2.207e+10	2.207e+10	2.205e+10

Exponentiated coefficients; 95% confidence intervals in brackets
$^{*} p < 0.05,$ $^{**} p < 0.01,$ $^{***} p < 0.001$