NBER WORKING PAPER SERIES

SPOUSAL HEALTH EFFECTS - THE ROLE OF SELECTION

James Banks
Elaine Kelly
James P. Smith

Working Paper 19438
http://www.nber.org/papers/w19438

NATIONAL BUREAU OF ECONOMIC RESEARCH
1050 Massachusetts Avenue
Cambridge, MA 02138
September 2013

This paper was supported by grants from the National Institute of Aging and to the Economic and Social Research Council for co-funding through the Centre for Microeconomic Analysis of Public Policy at the IFS . It w as presented in the Boulders NBER economic s of aging conference in May 2013. The expert programming assistance of Iva MacLennan is gratefully acknowledged . We appreciate the excellent comments of our discussant, Amitabh Chandra, and other participants at the economics of aging conference. The views expressed herein are those of the authors and do not necessarily reflect the views of the National Bureau of Economic Research.

Spousal Health Effects - the Role of Selection
James Banks, Elaine Kelly, and James P. Smith
NBER Working Paper No. 19438
September 2013
JEL No. I0

ABSTRACT

In this paper, we investigate the issue of partner selection in the health of individuals who are at least fifty years old in England and the United States. We find a strong and positive association in family background variables including education of partners and their parents. Adult health behaviors such as smoking, drinking, and exercise are more positively associated in England compared to the United States. Childhood health indicators are also positively associated across partners.

We also investigated pre and post partnership smoking behavior of couples. There exists strong positive assortative mating in smoking in that smokers are much more likely to partner with smokers and non-smokers with non-smokers. This relationship is far stronger in England compared to the United States. In the United States, we find evidence of asymmetric partner influence in smoking in that men's pre marriage smoking behavior influences his female partner's post marriage smoking behavior but there does not appear to be a parallel influence of women's pre-marriage smoking on their male partner's post-marital smoking. These relationships are much more parallel across genders in England.

James Banks
Arthur Lewis Building-3.020
School of Social Sciences
The University of Manchester
Manchester M13 9PL
United Kingdom
james.banks@manchester.ac.uk

Elaine Kelly
Institute for Fiscal Studies
7 Ridgmount Street
London
WC1E 7AE
United Kingdom
elaine_k@ifs.org.uk

James P. Smith
RAND Corporation
1776 Main Street
P.O. Box 2138
Santa Monica, CA 90407-2138
smith@rand.org

Partner selection is a potentially important and under-researched aspect of levels and inequality of health in all countries. If the healthy marry the healthy and the unhealthy the unhealthy and health of partners matters as seems likely, then partner selection will exacerbate health inequalities in a population. Health histories of partners may matter for at least three reasons (Moden, 2007; Oreffice and Quitana-Domeque, 2010; Silvertoinen et al, 2003). First, individuals may select their partners in part based on observable and unobservable aspects of their potential partner's prior health. Second, partner selection may depend on factors such as education and health behaviors (smoking, drinking and exercise), which are correlated with current and future health. Third, couples typically share a common life-style and the same household environment. Health outcomes may therefore become more correlated over time are partners are exposed to similar environmental risks, whether through choice or unexpected shocks.

Partner selection may matter as well for international differences in health outcomes. In some countries, partner selection is at the discretion of parents and may be heavily influenced by customs and only take place within narrowly defined and highly stratified groups. Even in industrialized countries with similar levels of average incomes, heterogeneity and geographic mobility may vary a good deal producing quite different degrees of partner selection. The case we analyze in this paper- England and the United States- is a good example since the United States is a more heterogeneous country (if only due to their immigration history and size) and there is much more geographical mobility in the U.S. than in England (Banks et al, 2012).

There are two aspects of the existing scientific infrastructure that has limited research on this question. Until recently, our major surveys have been focused on individuals, or when there was information on couples there would be only a single household reporter for both individuals in the partner/spousal unit. That is a major limitation especially when we need to know pre-

partnership data about both people (Smith, 2009). The partner/spouse data in our analysis were reported by each partner about themselves. Secondly, comparable cross-national data did not exist. These two limitations do not restrict our research here since our two data sets for England and the United States (the English Longitudinal Survey for England (ELSA) and the Health and Retirement Study for the U.S. (HRS)) made international data comparability an essential part of their design. Both surveys also included in their later waves detailed childhood health and background histories which allow us to investigate pre-partnership information on health and other relevant traits.

This paper is divided into four sections. The next section highlights the main attributes of the English and American data we use in this research. Section 2 summarizes our results on the nature of the association between spouses and partners in terms of their pre- partnership health and SES backgrounds as well as their contemporary health status and health behaviors at the time of the two surveys. The third section examines models of marital dissolution as affected by prior to relationship childhood health and the pre- and post- marital patterns of partnership smoking behavior**.** The final section highlights our main conclusions.

1. Data

This research primarily uses data from two surveys — the English Longitudinal Survey of Aging (ELSA) and the American Health and Retirement Survey (HRS). Both collect longitudinal data on health, economic status, work, and well-being from a representative sample of the English and American populations aged 50 and older. ELSA and HRS are strong in the measurement of socioeconomic variables and health (self-reported subjective general health status, prevalence and incidence of physical and mental disease during the post age 50 adult

years) and salient health behaviors (smoking, alcohol consumption, and physical activity). An important advantage of both data sets for our research in this paper is that each spouse/partner reports separately about their own health status and health behaviors as well as many aspects of their pre-partnership lives including their family SES and their childhood health.

One limitation of ELSA and HRS is that data collection only begins at age 50 (and even later for older cohorts at the time of the initial baseline interview). Fortunately, this limitation was recognized, and both HRS and ELSA included very similar retrospectively reported childhood health histories.[1] In addition to a subjective question rating their childhood health before age 16 on the standard five-point scale from excellent to poor, respondents in both surveys were asked about the occurrence of a set of common childhood illnesses. If the condition did exist, they were asked the age of first onset. The age 50 restriction is also recognized later in the paper when we use two data sets that represent the entire age adult age distribution in the two countries- Understanding Society in England and the Panel Survey of Income Dynamics in the United States.

The list of childhood illnesses that were asked was very similar in the two surveys but not identical- some diseases were asked in one survey but not the other.[2] Even within these set of childhood conditions, there are differences in wording or inclusion that must be taken into account. The following childhood diseases have basically the same wording in both surveys—asthma, diabetes, heart trouble, chronic ear problems, severe headaches or migraines, and

[1] ELSA fielded their childhood health history between its wave 3 and wave 4 core interviews between February and August 2007. The HRS childhood health history was initially placed into an internet survey in 2007 for those respondents who had internet access and who agreed to be interviewed in that mode. The remainder of HRS respondents received the same childhood health history as part of the 2008 core interview. See details about the nature of these histories see Smith, 2009a and Banks, Oldfield, and Smith (2012).

[2] For example, the following childhood conditions and diseases were asked in ELSA but not in HRS- broken bones and fractures; appendicitis; leukemia or lymphoma; cancer or malignant tumor. The following conditions were asked in HRS but not in ELSA- difficulty seeing even with glasses or prescription lenses; a speech impairment; stomach problems; high blood pressure; a blow to the head, head injury or trauma severe enough to cause loss of consciousness or memory loss for a period of time.

epilepsy or seizures. For the common childhood infectious diseases, HRS respondents were asked about mumps, measles, and chicken pox separately while ELSA respondents were asked a single question about all infectious disease with the question wording mentioning these three diseases but also including polio and TB.[3]

Both HRS and ELSA have measures of the family background of respondents although the measures are more similar in concept than in execution between the surveys. In the HRS, we know the occupation of the father when the respondent was 16 years old, the education of both mothers and fathers, whether each parent is alive and if not the age of death, and the economic status of the family during the respondents' childhood years.[4]

In ELSA, we have information on the occupation of the father when the respondent was 14 years old, the education of both parents, whether each parent is alive and if not the age of death, and some more limited information on the economic status of respondent's family in childhood. Finally, in both surveys when there was only a single lifetime relationship we know pre- and post-relationship patterns of smoking behavior of both partners.

[3] The biggest difference between the two surveys involves allergies and respiratory problems. In HRS, respondents were asked about respiratory disorders which included bronchitis, wheezing, hay fever, shortness of breath, and sinus infections and were separately asked about any allergic conditions. ELSA respondents were asked about allergies including hay fever and then separately about respiratory problems. Thus, hay fever shows up in a different category in the two surveys. The other difference of possible significance concerns the category of emotional and psychological problems which included two questions about depression and other emotional problems in HRS and one question about emotional, nervous, or psychiatric problems in ELSA. In addition to any impact of these wording differences, the form in which the questions were asked also differed between the two surveys. HRS respondents were asked separate questions about each condition while ELSA respondents were shown a 'show card' which contained a list of conditions and then asked to identify any that they may have had before age 16. The show card format could lead to lower reported prevalence if respondents that had multiple conditions only identify a subset from show cards, whilst they would have answered in the affirmative to each of the questions individually had they been asked.

[4] HRS respondents were asked the following question "Now think about your family when you were growing up, from birth to age 16. "Would you say your family during that time was pretty well off financially, about average, or poor?" The categories of response were pretty well off financially, about average, poor.

2. Selection Effects of Partners

2.1 Relationships between Spousal Attributes

Table 1 documents estimated relationships between early and later life attributes of spouses in terms of health outcomes, health behaviors, and SES background in both England (using ELSA) and the United States (using HRS). Health outcomes are provided separately for the childhood years and for contemporary health outcomes at the time of the HRS and ELSA surveys. In this research, we are using the 2006 (for the health information) and 2008 (to retrieve the childhood health information) waves of HRS and the 2006 ELSA wave when their life history module was administered.

Much of the literature on inter-couple correlations in health has focused on height and weight, where studies consistently find strong positive associations (Taubs et al, 1992; Taubs et al 1991; Oreffice and Quitana-Domeque, 2010; Silvertoinen et al, 2003). A smaller literature focuses on health conditions, and finds positive correlations for the majority of conditions considered (Di Castelnuovo et al, 2008; Wilson, 2002; Moden, 2007).

Table 1 lists age adjusted associations between spouses/partners in anthropometric measurements, their health conditions and self-reported health in both adulthood and childhood, the standard list of health behaviors (exercise, drinking, smoking, and BMI type outcomes), as well as their SES background during childhood and parental attributes both now and in childhood. The estimated coefficients in Table 1 are all derived from a series of regressions of the female attribute on that of her male partner's attribute in the same domain in a model that also includes age quadratics in both partners' ages. We also estimated a parallel set of models where the male partner trait was the outcome variable and the female partner trait was the

regressor (still including the two age quadratics). The coefficient estimates were as expected given the male and female differences in the range of the specific outcomes. None of the substantive conclusions of this paper is affected by which spouse is used as the RHS trait.

Our adult health indicators consist at this point of adult self-reports of specific diseases and general health status on the standard five point scale from excellent to poor**.** In keeping with existing work on the spousal correlations in health conditions (Moden, 2007; Casetlnuovo et al, 2008), both partners age adjusted specific disease prevalences are positively associated across spouses. These associations appear generally to be somewhat higher in the United States compared to England. In our view, we would characterize these associations as positive but not particularly large.

We tend to find the reverse country level relationship when we examine reports of childhood disease in that in this case the spousal association in childhood disease appears to be definitely higher in England. This seems particularly true for emotional issues as a child and contagious diseases such as mumps, chicken pox, and measles, which are far more positively associated in England compared to the United States. While we can only measure this in the USA data, learning disabilities as children exhibit one of the stronger associations across partners. Even the more objective height measure, often used as an indicator of childhood nutrition, is somewhat more positively associated across partners in England.

There are much higher partner relationships between health measures that rely on subjective reports on health than on reports of disease and these correlations now tend to be distinctly higher in England than in the United States. For example, the association across spouse/partners in reporting age adjusted adult health as excellent or very good is 0.32 in England compared to 0.20 in the U.S. Similarly, being in excellent or poor health as a child has

an association that is twice as large in England compared to the United States. If fair or poor childhood health is used instead, the association is three times larger in England. Since the existence of adult disease appears on average to be slightly more positively correlated in the US compared to England, the higher association in subjective reports of health suggests that health reporting thresholds of spouse/partners are more similar in the more culturally homogenous England than in the more heterogeneous America.

When we examine adult health behaviors (exercise, smoking, drinking, and indicators of obesity), the results are strikingly uniform in that these health behaviors are strongly positively associated across partners and much more so in England compared to the United States. Couples in England are much more likely to both smoke, drink, and engage in vigorous exercise if not together at least as a parallel common part of their lives. The only exception to that cross national comparison is that BMI type of measures such as obesity and being overweight are slightly more closely related in the United States. That may indicate that types and quantities of food are more commonly consumed among partners in the United States. This greater similarity in health behaviors in England is interesting in that health outcomes across partners/spouses appear somewhat more positively correlated in the United States.

One particularly interesting relationship in the adult behaviors sub-segment of Table 1 concerns quitting smoking. When one of the partners quits smoking, the odds are more than fifty percent larger in England compared to the United States that the other partner will also be a smoke quitter. Part of the much higher similarity among partners in currently smoking compared to ever smoking most likely reflects the fact that 'ever' includes a long period of time that the partners were not together and their behaviors could not influence each other. We will model these patterns of smoking behavior in the next section.

Turning to the family background variables on which the most research has been done (Mare, 1991; Pencavel, 1998), the association in education of partners is slightly higher in England compared to the United States (0.55 compared to 0.48). In the United States in HRS we also know education of parents of both of the partners. The education of parents is even more positively associated than that of the partners (about 0.6). In fact, the education of both partners' mothers and both partners' fathers are also highly positively associated (0.46 and 0.40 respectively) indicating that much more so than in health social background is highly socially stratified.

Not surprisingly, other aspects of partners SES backgrounds appear also to be positively associated. One difficulty in making these cross-national comparisons in the domain of family background is that there are only a few background variables that are strictly comparably defined in HRS and ELSA. One such variable that is reasonably comparably defined is whether the father of the respondent had an occupational code labeled professional. In ELSA, a respondent's father is defined as professional if the respondent defines their main job as "manager or senior official in someone else's business", "running their own business", or "profession or technical".. This association across partners is twice as high in England compared to the United States.

Table 1 presents measures of association of partners only adjusting for their ages. There may be other characteristics that matter in influencing the strength of this association. For example, spousal attributes (at least for first marriages) may be more positively associated the older one is when one gets married. This may partially reflect a more mature judgment in choosing a partner, an ability to obtain more information on the potential partner, or a greater realization of the consequences of early life influences on adult life outcomes. Similarly, these early life associations may vary with whether this is a first marriage or not since a previous

marriage failure may lead to choosing a different set of traits in a partner. To investigate these conjectures, we reran these models that underlie Table 1 controlling for age at marriage of both partners and whether this is a first marriage. Age of partner was not statistically significant so we concentrate on the changing association of these spousal attributes with the number of lifetime relationships

Table 2 displays changes in partner relationships by the number of relationships for the United States while Table 3 does the same for England. Because sample sizes in HRS are higher than in ELSA, we present a three way partnership classification in HRS (1, 2, 3+) and a two way partnership classification in ELSA (1, 2+). These models are estimated separately by these relationship categories and once again also include an age quadratic for both partners.

The most distinct pattern we find, and it is present in both countries, is that associations in SES background clearly fall in multiple marriages. In the United States, even the association of education of partners is half as large in 3 plus relationships compared to single relationships that endure. The same is true, if to a lesser degree, in the size of this association in education of parents and in education of mothers and fathers of partners. If not as sharp, a similar pattern is found in England. While there is a slight decline in the association between partners in race and much more so in Latino ethnicity with multiple partnerships in the United States, the association remains highly positive in all marriage groups in the US sample in these age cohorts. Most of the recent increase in intermarriage across race and ethnicity post-dated the age groups in the age 50 plus HRS sample.

In terms of adult health behaviors, we find a quite uneven pattern with more similarity in some behaviors (smoking) but less of an association in others (drinking a lot). In the United

States and England, childhood health is generally more positively associated in first relationships while the opposite is true for adult health.

3.1 Marriage Models

The theoretical impact of health on the probability marriage or cohabitation is ambiguous. Healthier individuals will attract a higher "price" on the marriage market, but marriage provides a form of insurance that is of greater benefit to the less healthy. Lillard and Panis (1996) used the PSID to show that amongst men better health (on a composite measure) is associated with greater hazard of marriage and a lower hazard of divorce. However, once they condition on socio-economic characteristics, healthier men are less likely to marry, supporting the insurance hypothesis. The results therefore point towards strong positive selection into marriage on the basis of factors correlated with health (such as income and education), which dominate the negative selection generated by the insurance motivation. Fu and Goldman (1994) also find evidence of selection with risky behavior such as smoking and drug taking, and physical characteristics such as obesity and short stature delaying entry into marriage.

Data limitations mean that there is far less work on the impact on marriage of childhood health. That is principally because there are few panels that go from childhood to the latter life years collecting prospectively health outcomes and fewer still that collect information on both partners. These constraints are relaxed with the data we use in this study.

Tables 4 (for women) and 5 (for men) summarize results from our models estimating effects of childhood health and background variables on a set of marriage related outcomes in the two countries. The English models are in the A panels of these tables and the American models are in the B panel. The marriage outcomes we investigate include whether you ever cohabited (including marriage), experienced multiple marriages/cohabs, were ever divorced, and the age of

first cohabiting or marriage. Separate models are estimated for women and men in both England and the United States.

In addition to an age quadratic and constant term (not displayed in the Tables), these models include controls for having a major illness and a minor illness as a child, whether one's mother or father died before age 70, whether one's father was in a professional job when one was a child, and education of respondent. In England the education variable is labeled Ed normed which is equal to the number of years of education minus the compulsory school leaving age. Hence normed is equal to 0 if the cohort member left school at the compulsory school leaving age, -1 if they left the year before, and 1 if they left the year after. This is to take into account the change in the compulsory schooling age implemented in 1947. The estimated effects of the other variables in these models are not sensitive to the inclusion of own years of schooling as a control variable.

Among English and American men and women, illness during childhood has little effect on whether one ever cohabited in large part since most people in our age group have had at least one relationship.[5] The only exception to this generalization is that having experienced a major illness during childhood reduced the probability of cohabiting/marriage among American men.

In contrast, we find statistically significant effects of both major and minor illnesses during childhood on whether one has had multiple partnerships or has even been divorced for both English and American women (see Table 4). We also find that these childhood illnesses reduced the age of first relationship for women in both countries. Table 5 shows that these effects of childhood illness on our measures of relationship stability are much weaker for men

[5] The fraction who had been in a relationship are .962 (American men), .991 (American women) , .968 (English men), and .971 (English women).

particularly in England. The only exception is that major childhood illness increase the probability of divorce among American men.

Why would childhood illness effects on relationship stability be there for women but not for men? The fact that this gender difference exists in both countries suggests that the explanation is not specific to unique aspects of the culture of each country but lies instead in gender roles. One gender role that may well come into play is that within relationships, especially in these age groups women are the care givers and are a force in improving the health of their spouses. Poor health in childhood for women which eventually will be transmitted to poorer health in adulthood may make the relationship less stable since not only might women find it more difficult to help their partners but their male partners may not be willing to provide help needed with the adult health problems of the woman.[6]

3.2 Smoking Models

In this section, we analyze patterns of smoking behavior pre and post marriage to assess the influence of partners on smoking behavior. Table 6 summarizes basic patterns of pre and post marriage smoking behavior as revealed in the HRS for the United States and in ELSA for England**,** and shows that on almost all dimension the countries are very similar.

The birth cohorts in HRS and ELSA, and especially the men, were clearly heavy smokers in the past who also exhibit significant quitting behavior, a part of which at least in the United States no doubt was induced by the Surgeon's General report. In both countries, about two-thirds of men and two-fifths of women were ever smokers. Current smoking behavior is much lower than ever smoking with about 10% of men and women still smoking in both samples.

[6] Differences in the effects of individual characteristics on marriage by gender are not limited to childhood health. Oreffice and Quitana-Domeque (2010) find strong inter-spousal correlations in height and weight, but additional penalties from poor health characteristics vary by gender. Shorter men are more likely to marry shorter women, heavier women with a lower level of education. The husbands of heavier women tend to be shorter, poorer, and less educated. The marriage market does not additionally penalize short women or heavier men.

Most smoking behavior is initiated before marriage. Among men who ever smoked, 87% in the United States and 96% in England started before marriage. For women ever smokers, there is a more sizable difference with 68% starting before marriage in the United States, compared to 88% in England. This is the most sizable cross country difference in Table 6, and is also reflected in the proportion of women who start smoking before marriage (27% in the United States compared to 38% in England). In England, among those who started smoking before marriage, the average time before (first) marriage was 5.0 years for women and 8.6 years for men. A significant fraction of those who smoked before marriage continued that behavior after the start of their marriage.

The final two rows show the smoking behavior of this sample before their marriage so that it reflects smoking selection associated with marriage. In the United States, among male smokers before marriage, 34% of them married a smoker while among male non-smokers before marriage 21% married a smoker. The corresponding numbers for American women are as follows- among female smokers at marriage 69% married a smoker while for female non-smokers 52% married a smoker. Thus, while there is a distinct positive association at marriage between smoking behaviors of partners it remains the case that many non-smokers also marry smokers. This is especially true for American women which may not be surprising since so many men smoked during that time period in the HRS birth cohorts.

The corresponding numbers for England in Table 6 show similar assortative mating in pre-marital smoking behavior for English women, with 70% of English female smokers at the time of their marriage also married smokers compared to only 54% for female non-smokers marrying smokers. Assortative mating for English men is of a similar magnitude, with 45% of male smokers marrying smokers compared to only 29% for male non-smokers.

Table 7 presents results of models estimating the relationship between post marriage and current smoking behavior to smoking before marriage of both partners in the United States. In addition to our standard age quadratics, our American models also include, controls for education (three dummy variables for years of education-0-11 years, 12-15 years, and 16 or more years with the middle group serving as the reference group), African-American race, and Hispanic ethnicity. Our corresponding English models are presented in Table 8 with the only difference being the absence of the two American ethnicity variables and the use of the education normed variable instead of the American education dummies.

Consider the American models first. Among men, African-Americans smoke more but at the time of the administration of our HRS sample and post marriage while there are no statistically significant between group differences for African-American women. These differences are much smaller for Hispanics with the only statistically significant difference existing for Latinas who smoked somewhat less after marriage. Education differences in smoking are well established in the United States (Goldman and Smith, 2010) and these patterns are replicated in Table 7. Smoking is highest among the least educated and lowest among the most educated for both genders. We find a similar negative effect of education in the English models in Table 8.

Our main interest in the models in Table 7 concerns estimated effects of own and spousal pre marriage smoking. In terms of ever smoking after marriage, not surprisingly, smoking before marriage is a very strong predictor for both men and women. When we examine current smoking, the estimated effects of pre-marriage smoking are considerably smaller illustrating once again the significant degree to which these generations quit smoking.

Perhaps, the most interesting result in Table 7 is the asymmetric gender effects of pre-marriage partner smoking in the United States. Controlling for male partner pre marriage smoking, female partner pre-marriage smoking has no statistically significant effect on post marriage male smoking. In sharp contrast, the estimated effects of male partner pre-marriage smoking remain statistically significant and non-trivial even after we control for female pre-marriage smoking. To put it simply, at least in the domain of smoking, men influence women while women do not influence men on average to the same degree. By marrying a male smoker, women's health could be influenced in two ways- first the widely cited negative effects of exposure to second hand smoke and in addition the enhanced probability of becoming a smoker.

The parallel results for England are presented in Table 8. The own sex pre marriage estimates on current smoking are evidence of significant quitting behavior in England as well. The other lagged pre marriage coefficients are similar to what they were in the United States. In England, if both partners smoked it was apparently more difficult for both women and men to cease their smoking after marriage. As for the US, the estimated effects of male pre-marital smoking on female smoking are larger than the estimates for the effects of female smoking on male smoking. However, the magnitudes are smaller, and only the association between male pre-marital smoking and female smoking after marriage is statistically different from zero.

Table 9 contains our models for quitting smoking behavior for residents of both countries. We restrict the sample in these models for each gender to those whom ever smoked and add categorical variables for your partner's smoking behavior (never smoked, still smokes, quit smoking) with never smoked the reference group in the models. In both countries relative to partners who never smoked, individuals are less likely to quit if their partners are currently smoking with the magnitudes of these effects quite similar in both countries. We find a stronger

influence of partner behavior in England compared to the United States in that having a partner who quits smoking is positively associated with you also quitting smoking in England for both men and women. We find no such relationship in our American models.

3.3 Smoking models for younger cohorts

Attitudes towards smoking have changed dramatically since the ELSA and HRS cohorts started smoking and formed partnerships. In this section, we use alternative sources of data to consider whether our results hold for younger cohorts and the extent to which partnership sorting by smoking behavior has changed. Data for England comes from Understanding Society, a UK-wide longitudinal survey covering 40,000 households. We use data on smoking behavior from the second wave, conducted in 2010. Information on marriage and cohabitation is available. The American data come from the 2007 wave of the Panel Survey of Income Dynamics (PSID), the premiere all age group income panel in the United States.

Table 10 shows patterns of smoking behavior pre and post marriage, for cohorts aged 50+ and 30-49 in both countries. The A panel of Table 10 has data for England while the B panel contains the American results. Comparing the first two columns of Table 10.A and 10.B to the ESLA and HRS figures in Table 6 for essentially the same age group (ages 50+) shows that levels of previous and current smoking amongst the over 50s are somewhat higher in Understanding Society than in ELSA. In contrast, they are generally somewhat lower in PSID than in HRS, but the general patterns remain remarkably the same. The American result is not surprising in that the PSID sample of 50+ is younger than the HRS sample.

The comparison between the two age defined birth cohorts in Understanding Society and PSID gives the combined effect of differences by age and cohort. As expected, the proportion

who ever smoked is lower for those ages 30-49 than for those 50+, with a difference of 6.3 percentage points for men and 0.8 percentage points for women in England and even larger in the PSID where it is a difference of 19.5 percentage points for men and 7.0 percentage points form women, most likely reflecting the large secular decline in male smoking in the United States. The proportions that smoke now are higher for the younger cohort, in part because the probability of quitting rises with age.

The final two rows show the relationship between smoking and partner selection. Even though the shares that smoked before marriage are very similar across the two cohorts, the difference in proportion of smokers and non-smokers who married a smoker is much higher for those aged 30-49 than for those 50+, indicating greater pre-marital smoking selection in partners in the younger cohorts. While this is true in both countries, it is especially the case in England.

Table 11 decomposes the last two rows in Table 10 into those with compulsory education or less and more than compulsory education in England and for those with less than a high school degree and a college degree or more in the United States. For both birth cohort groups, the proportions of smokers who married smokers and non-smokers who married smokers are lower for those with more than compulsory education. This in part reflects lower overall smoking rates among the more educated. Within cohort differences by education level show no large changes.

For both education groups in England, smoking selection is greater for the younger cohort, with higher proportions of smokers marrying smokers and lower proportions of non-smokers marrying smokers**.** The largest cross-cohort differences are in the (increased) proportions of male smokers that marry smokers and the (reduced) proportions of female non-smokers that marry non-smokers. The change in the former does not differ by education level;

the change in the latter is much larger for more educated women. The remaining two groups, female smokers and male non-smokers, are most likely to marry someone with the same smoking behavior, and this increases only slightly over time. One explanation is that female smoking has always been undesirable to men who do not smoke. Over time and cohorts, this has strengthened slightly. The bigger change is in women's attitudes to men who smoke.

Table 12 provides models of smoking behavior in Understanding Society and the PSID that correspond to the models in Tables 7 and 8. The own effects in ELSA and 50+ Understanding Society cohorts are roughly similar, although own pre-marriage smoking has a larger effect on current smoking in Understanding Society, particularly for women. The partner effects are more consistently significant in the female smoking models.

As would be expected, the association between smoking and own pre-marriage smoking are stronger for the younger Understanding Society cohort, as the quit rate increases over time. However, the associations with partner's smoking behavior are also stronger and similar across men and women in the younger age group. For current smoking, this may be explained by increasing quit rates as cohorts age. However, the result for smoking after marriage suggests an increased responsiveness to partner behavior. This still largely remains not the case in the United States for the younger cohort in that they largely remain uninfluenced by partner's smoking. The main exception is that when both partners smoked before marriage married women are much more likely to be current smokers.

Table 13 provides models of quitting behavior that mirror those for the HRS and ELSA in Table 9. As in Table 9, there is a strong negative association between quitting smoking and having a partner that currently smokes. The association is stronger for the Understanding Society

over 50 cohort than in ELSA. By contrast, the association between quitting and a partner quitting is only statistically significant for the age 30-49 sample in Understanding Society and the 50+ sample in the PSID.

Conclusion

In this paper, we investigated the issue of partner selection in the health of individuals who are at least fifty years old in England and the United States. Such an investigation is now possible since data sets such as ELSA and HRS interview both partners in the relationship and also ask questions about central pre-partnership variables that include family background and childhood health.

We find a strong and positive association in family background variables including education of partners and their parents. Adult health behaviors such as smoking, drinking, and exercise are more positively associated in England compared to the United States. Childhood health indicators are also positively associated across partners. In general, these correlations are more positive for first than for subsequent partnerships. Especially for women, poor childhood health is associated future marital disruptions in both countries.

Because of the better availability of the necessary data, we investigated more closely the pre and post partnership smoking behavior of couples. There exists strong positive assortative mating in smoking in that smokers are much more likely to partner with smokers and non-smokers with non-smokers. This relationship is far stronger in England compared to the United States. In the United States, we find evidence of asymmetric partner influence in smoking in that men's pre marriage smoking behavior influences his female partner's post marriage smoking behavior but there does not appear to be a parallel influence of women's pre-marriage smoking

on their male partner's post-marital smoking. These relationships are much more parallel across genders in England.

In the age cohorts in our samples, there was historically strong quitting behavior in smoking. Once again, we find stronger evidence of spousal influence in England as being partnered with a smoker makes who quit smoking makes it more likely for you to quite as well. This relationship does not exist in the United States.

Tables

Table 1. Estimated Relationship of Woman's Attribute with Partner Attribute

	ELSA	HRS		ELSA	HRS
Adult Health			**Adult Behaviors**		
diabetes	.023	.041***	Exercise mod	.316***	.146***
HBP	.020	.047***	Ever smoke	.229***	.198***
cancer	-.019	.013	Now smoke	.329***	.265***
Lung	.049**	.085***	Quit smoking	.194***	.120***
			Drinks lots	.442***	.305***
major	.076***	.069***	overweight	.144***	.205*
minor	.084***	.089***	obese	.121***	.151***
Stroke	-.005***	-.024***	BMI	.257***	.285***
Heart conditions	.045**	.029*			
Arthritis	.103***	.114***			
Ex VG	.323***	.197***			
Fair/Poor	.248***	.195***			
Pain	.196***	.103***			
Childhood Health			**Background**		
Height	.240***	.213***			
Major	.141***	.005	Ed partners years	.549***	.482***
			Ed Parents years	NA	.603***
Minor	**.035***	.080***	SES as a kid	NA	.080***
Poor	.063**	.013	Father profess	.294***	.132***
Excel	.115***	.051***	Mom died	.020	.034**
Ear	-.016	-.009	Dad died	.018	.030**
Respiratory	.056**	.031*	Mom Disease	.078**	NA
Allergies	.032	.010	Father Disease	.080***	NA
Month ill	.009	NA	Parents unemployed *	.017	NA
			Black	NA	.923***
Month not in school	-.026	.022	Hispanic	NA	.823***
Emotion problem kid	.128*	.020	Ed Mothers	NA	.457***
Depression	NA	.028	Ed Fathers	NA	.400***
Diabetes	NA	-.002**			
Disability	NA	-.001			
Learning Disability	NA	.057***			
Contagious disease	.126***	.057***			

Woman's Attribute is the Outcome—The model contains her male partner's attribute (coefficients in Table) and a quadratic in both partners' ages. The sample consists of all current relationships.

Table 2. Estimated Relationship of Woman's Attribute with Partner Attribute by NUMBER OF PARTNERSHIPS—HRS

	1st	2nd	3+		1st	2nd	3+
Adult Health				**Adult Behaviors**			
Diabetes	.054***	.005	.007	Exercise mod	.150***	.128***	.190***
HBP	.066***	-.004	.028	Ever smoke	.208***	.143***	.092*
Cancer	.015	.026	-.049	Now smoke	.243***	.217***	.415***
Lung	.044**	.101***	.275***	Quit smoking	.126***	.077***	.151***
Major	.070***	.052*	.084	Overweight	.012	.065**	.048
Minor	.080***	.100***	.114**	Obese	.151***	.154***	.152***
Stroke	-.022*	-.043***	.001	BMI	.284***	.270***	.313***
Heart condition	.017	.056**	.055	Drinks a lot	.304***	.317***	.286***
Arthritis	.104***	.158***	.083*				
Ex VG	.218***	.165***	.114**				
Poor	.202***	.178***	.166***				
Pain	.085***	.137***	.134**				
Childhood Health				**Background**			
Height	.229***	.161***	.185***	Ed spouse years	.541***	.351***	.262***
Major kid	-.000	.001	.025	Ed Parents years	.628***	.547***	.547***
Minor kid	.085***	.085***	.024	SES as a kid	.082***	.062***	.110
Poor kid	.005	.026	.043	Father profess	.131***	.100**	.210***
Excel kid	.054***	.044	.044	Mom died	.050***	.032	.060
Emotion problem as kid	.010	.027	.028	Black	.935***	.928***	.902***
Depress kid	.008	.022	.136	Hispanic	.872***	.676***	.549***
Drugs and booze	-.005*	-.007*	-.019**	Ed Mothers	.486***	.340***	.373***
Respiratory	.021	.045	.057	Ed Fathers	.436***	.297***	.233***
Disability kid	-.021**	.057	.009				
Learn disability kid	.075**	.035	.036				
Kid contagious	.066***	.037	.009				

Woman's Attribute is the Outcome—The model contains her partner's attribute (coefficients in Table) and a quadratic in both partners' ages. The sample consists of all current relationships.

Table 3. Estimated Relationship of Woman's Attribute with Partner Attribute by NUMBER OF PARTNERSHIPS—ELSA

	1st	2+		1st	2+
Adult Health			**Adult Behaviors**		
diabetes	.016	.047	Exercise mod	.312***	.326***
HBP	.026	-.016	Ever smoke	.213***	.236***
cancer	-.019	-.022	Now smoke	.307***	.347***
lung	.054**	.085***	Quit smoking	.193***	.191***
asthma	.027	.087*	Drinks lots	.442***	.387***
major	.067***	.106**	overweight	.160***	.074
minor	.082***	.087**	obese	.116***	.137**
stroke	-.006	-.006	BMI	.282***	.159**
heart condition	.040*	.058			
arthritis	.101***	.120***			
Ex VG	.320***	.197***			
Poor	.224***	.342***			
pain	.221***	.114***			
Childhood Health			**Background**		
Height	.256***	.177***	Parents argue	.082***	.023
Major kid	.151**	.110	Ed spouse years	.578***	.460***
Minor kid	.024	.069			
Poor kid	.072***	.034	Father profess	.310***	.232***
Excel kid	.117***	.105**	Mom died	.023	.032
Ear kid	-.007	-.038	Dad died	.021	-.002
Respiratory kid	.082**	.007	Mom Disease	.068**	.069
Allergies kid	.007	.091	Father Disease	.086***	.032
Asthma kid	-.003	.025			
Emotion problem as kid	.134*	.117			
Kid contagious	.098***	.204***			

Woman's Attribute is the Outcome—The model contains her partner's attribute (coefficients in Table) and a quadratic in both partners' ages. The sample consists of all current relationships.

Table 4

A. Marriage Female—England

VARIABLES	(1) Ever cohabit	(2) Multiple Marriages	(3) Ever divorced	(4) Age first cohabit
Female major Kid	-0.015	0.078**	0.092**	-0.584**
Female minor Kid	0.007	0.031**	0.036**	-0.339**
F Dad died <70	0.008	-0.010	-0.001	-0.122
F Mom died <70	0.002	-0.001	0.023	-0.147
Female father prof	0.010	0.026	0.003	0.073
Female Ed normed	-0.007***	-0.014***	-0.011***	0.556***
Observations	4,305	3,860	4,146	4,143
R-squared	0.015	0.041	0.060	0.086

B. Marriage Female—United States

VARIABLES	(1) Ever cohabit	(2) Multiple Marriages	(3) Ever divorced	(4) Age first cohabit
Female major Kid	0.003	0.060***	0.080***	-0.122*
Female minor Kid	0.001	0.032***	0.025**	-0.069
F Dad died <70	0.000	0.008	-0.004	-0.169
F Mom died <70	0.011**	0.010	0.017	0.013
Female father prof	-0.006	-0.002	0.000	0.325
Female Ed	-0.000	-0.000	0.003*	0.216**
Observations	9,391	9,391	9,391	9,001
R-squared	0.001	0.012	0.014	0.076

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Models also include age quadratics of both partners.

Table 5

A. Marriage Male—England

VARIABLES	(1) Ever cohabit	(2) Multiple Marriages	(3) Ever divorced	(4) Age first cohabit
Male major Kid	-0.021	0.016	0.037	0.616
Male minor Kid	0.001	0.018	0.018	-0.155
M Dad died <70	-0.005	0.035**	0.046***	-0.191
M Mom died <70	0.011	0.002	0.004	-0.347*
Male father prof	0.002	0.012	0.007	0.233
Male Ed normed	-0.000	-0.009***	-0.013***	0.273***
Observations	3,344	3,055	3,187	3,185
R-squared	0.001	0.021	0.042	0.038

B. Marriage Male—United States

VARIABLES	(1) Ever cohabit	(2) Multiple Marriages	(3) Ever divorced	(4) Age first cohabit
Male major Kid	-0.036**	0.015	0.046*	0.457
Male minor Kid	-0.008	0.001	-0.003	-0.013
M Dad died <70	-0.004	0.014	0.010	0.000
M Mom died <70	-0.010	-0.013	-0.015	0.051
Male father prof	0.009	0.000	0.006	0.506**
Male Ed	0.001	-0.001	0.001	0.069**
Observations	6,585	6,585	6,585	6,266
R-squared	0.031	0.001	0.053	0.057

Robust standard errors in parentheses. Models include an age quadratic and constant term.
*** p<0.01, ** p<0.05, * p<0.1

Table 6

Patterns of Smoking Behaviors Pre and Post Marriage in the United States and England

	United States		England	
	Men	Women	Men	Women
Ever	62.4%	39.0%	62.7%	43.4%
Now	10.8%	8.3%	10.9%	10.1%
Both Partners never smoked	27.9%	27.9%	26.1%	26.1%
Fraction of smokers who quit	82.7%	78.7%	82.7%	76.8%
Start before marriage	55.4%	27.3%	59.9%	38.1%
Fraction of smokers who started <marriage	87.1%	67.9%	95.5%	87.9%
Smoked after marriage	58.6%	36.9%	52.4%	37.4%
Smokers before Marriage who married smokers	33.9%	68.5%	44.5%	69.9%
Non-Smokers before Marriage who married smokers	21.0%	51.6%	28.7%	53.8%

Source: Calculations by authors from the HRS and ELSA.

Table 7
Models of Smoking Behavior in United States

	Married Men	Married Women	Married Men	Married Women
	Currently smoke	Currently smoke	Smoke > marriage	Smoke > marriage
Male Smoked < Marriage	0.116***	0.025***	0.770***	0.070***
Female Smoked < Marriage	0.020	0.089***	0.044	0.785***
Male and Female Smoked < Marriage	0.009	0.043	-0.036	-0.048*
Ed 0-11	0.050***	0.064***	0.020	0.062***
Ed 16+	-0.065***	-0.039***	-0.058***	-0.069***
African-American	0.063***	0.000	0.072***	0.009
Hispanic	-0.024	-0.031	-0.006	-0.055**
constant	-0.077	-0.154**	0.221***	-0.191*

Data – Health and Retirement Survey- Models also include an age quadratic.

Table 8

Models of Smoking Behavior in England

	Married Men	Married Women	Married Men	Married Women
	Currently smoke	Currently smoke	Smoke > marriage	Smoke > marriage
Male Smoked < Marriage	0.138***	0.014	0.751***	0.055***
Female Smoked < Marriage	-0.009	0.189***	0.036	0.662***
Male and Female Smoked < Marriage	0.061*	0.015	0.052	0.136***
Ed normed	-0.008**	-0.014***	-0.009***	-0.013***
constant	0.096	0.691**	-0.221	0.102
Observations	1,616	1,613	1,586	1,606

Data – ELSA- Models also include an age quadratic.

Table 9: Models of Quitting Behavior

	United States		England	
	Married Men	**Married Women**	**Married Men**	**Married Women**
	Quit Smoking	**Quit Smoking**	**Quit Smoking**	**Quit Smoking**
Partner smokes now	-0.277***	-0.337***	-0.336***	-0.310***
Partner quit	-0.004	-0.032	0.041*	0.095***
Ed normed	NA	NA	0.008	0.025***
Ed 0-11	-0.054**	-0.100***	NA	NA
Ed 16+	0.084***	0.031	NA	NA
constant	0.953***	1.169***	0.689	-0.668

Sample consists of ever smokers.

Table 10: Patterns of Smoking Behaviors Pre and Post Marriage in the United States and England

10. A England

	Men 50+	Women 50+	Men 30-49	Women 30-49
Ever	68.5%	53.8%	61.3%	52.4%
Now	17.1%	16.0%	29.0%	22.6%
Both Partners never smoked	18.9%	18.9%	25.6%	25.6%
Fraction who quit	76.6%	68.3%	52.8%	57.0%
Start before marriage	58.9%	42.5%	52.7%	44.5%
Fraction of smokers who started <marriage (ever)	85.9%	79.0%	91.5%	84.5%
Smoked after marriage	56.7%	47.3%	52.2%	43.6%
Smokers before				
Marriage who married smokers	47.1%	65.3%	53.8%	67.9%
Non- Smokers before Marriage who married smokers	35.8%	54.1%	32.6%	46.7%

Notes: Understanding Society, wave 2. Respondents in England who have partners, have non-missing partnership and smoking information, and whose partners have non-missing partnership and smoking information.

10. B United States

	Men 50+	Women 50+	Men 30-49	Women 30-49
Ever	53.1%	33.4%	33.6%	26.4%
Now	13.3%	7.3%	15.4%	11.1%
Both Partners never smoked	36.7%	36.7%	55.5%	54.1%
Fraction who quit	74.9%	78.1%	54.2%	58.0%
Start before marriage	43.6%	23.8%	29.2%	21.9%
Fraction of smokers who started <marriage (ever)	82.1%	71.3%	86.9%	83.0%
Smoked after marriage	42.5%	27.8%	26.0%	20.6%
Smokers before				
Marriage who married smokers	33.7%	60.5%	39.3%	52.8%
Non- Smokers before Marriage who married smokers	17.7%	38.7%	14.4%	23.4%

Note- Sample is from the PSID

Table 11: Partner Selection and Smoking Behavior, by Age and Education, Understanding Society

A. Understanding Society in England

	Compulsory only		**More than Compulsory**	
	Men	Women	Men	Women
Aged 50+				
Smokers at marriage who married smokers	50.0%	65.7%	43.9%	63.5%
Non-Smokers before Marriage who married smokers	41.5%	56.4%	33.8%	53.0%
Aged 30-49				
Smokers at Marriage who married smokers	56.5%	68.1%	51.5%	66.8%
Non-Smokers before Marriage who married smokers	37.6%	52.5%	30.6%	44.2%

B. Panel Survey of Income Dynamics in USA

	Less than 12		**16 or more**	
	Men	**Women**	**Men**	**Women**
Aged 50+				
Smokers at marriage who married smokers	50.0%	69.2%	39.5%	59.6%
Non-Smokers before Marriage who married smokers	25.0%	47.5%	26.4%	31.1%
Aged 30-49				
Smokers at Marriage who married smokers	38.5%	90.0%	23.3%	50.0%
Non-Smokers before Marriage who married smokers	19.2%	38.7%	12.6%	19.5%

Table 12

Models of Smoking Behavior by Age,

A. Understanding Society for England

	Married Men	**Married Women**	**Married Men**	**Married Women**	**Married Men**	**Married Women**	**Married Men**	**Married Women**
	Currently smoke	**Currently smoke**	**Smoke > marriage**	**Smoke > marriage**	**Currently smoke**	**Currently smoke**	**Smoke > marriage**	**Smoke > marriage**
	50+	**50+**	**50+**	**50+**	**30-49**	**30-49**	**30-49**	**30-49**
Male Smoked < Marriage	0.150***	0.055**	0.731***	0.074***	0.366***	0.071***	0.851***	0.104***
Female Smoked < Marriage	0.048	0.205***	0.031	0.798***	0.055*	0.279***	0.125***	0.743***
Male and Female Smoked < Marriage	0.050	0.040	-0.014	-0.088**	0.070*	0.084**	-0.100***	-0.007
Ed normed	-0.013***	-0.009***	-0.008***	-0.008***	-0.012***	-0.015***	-0.002	-0.008***
constant	0.597	-0.187	-0.324	-0.434	0.257	0.251	0.272	-0.460
Observations	1,376	1,375	1,132	1,279	1,689	1,688	1,491	1,541

B. United States- PSID

	Married Men	Married Women	Married Men	Married Women	Married Men	Married Women	Married Men	Married Women
	Currently smoke	Currently smoke	Smoke > marriage	Smoke > marriage	Currently smoke	Currently smoke	Smoke > marriage	Smoke > marriage
	50+	50+	50+	50+	30-49	30-49	30-49	30-49
Male Smoked < Marriage	0.228***	0.039**	0.769***	0.065**	0.395***	0.025	0.710***	0.030
Female Smoked < Marriage	0.031	0.180***	0.028	0.633***	0.013	0.304***	-0.017	0.618***
Male and Female Smoked < Marriage	-0.055	-0.077	0.031	0.116*	0.022	0.102*	0.137**	0.176***
Ed 0-12	0.273***	-0.005	0.005	0.102**	0.227***	0.092**	0.119**	0.037
Ed 16 plus	-0.039	-0.047**	-0.125***	-0.040*	-0.030	-0.044***	-0.053**	-0.047**
constant	0.031	0.032***	0.092***	0.078***	0.028***	0.026***	0.043***	0.046***

Table 13: Models of Quitting Behavior

A. England- Understanding Society

	Married Men	Married Women	Married Men	Married Women
	Quit Smoking	Quit Smoking	Quit Smoking	Quit Smoking
	Aged 50+		Aged 30-49	
Partner smokes now	-0.416***	-0.317***	-0.442***	-0.386***
Partner quit	-0.032	-0.010	0.029	0.092***
Ed normed	0.010**	0.015***	0.015***	0.011***
Constant	1.555*	-0.224	0.634	0.411

B. United States-PSID

	Married Men	Married Women	Married Men	Married Women
	Quit Smoking	Quit Smoking	Quit Smoking	Quit Smoking
	Aged 50+		Aged 30-49	
Partner smokes now	-0.305***	-0.331***	-0.313***	-0.333***
Partner quit	0.083**	0.041	0.093	0.060
Ed 0-11	-0.332***	0.043	-0.237***	-0.288***
Ed 16 plus	0.032	0.063	0.027	0.083
Constant	0.768***	0.801***	0.604***	0.665***

References

Banks, James, Richard Blundell, Zoe Oldfield, and James P Smith Housing Mobility and Downsizing at Older Ages in Britain and the USA." *Economica* (January 2012) Volume 79, No. 313. pp. 1–26.

Banks, James, Zoe Oldfield, and James P Smith. "Childhood health and Differences in late life outcomes between England and America." Investigations in the Economics of Aging. pp. 321-343. 2012. David Wise Editor University of Chicago Press

Di Castelnuovo A., G. Quacquaruccio, M. Benedetta Donati, G. de Gaetano, and L. Iacoviello (2009) "Spousal Concordance for Major Coronary Risk Factors: A Systematic Review and Meta-Analysis" *Am. J. Epidemiol*. 169(1): 1-8

Goldman, Dana and Smith, James P. "The Increasing Value of Education to Health," Issue 10. May 2011. *Social Science and Medicine.* 72 (2011) pp. 1728 to1737.

Kapteyn, Arie, Smith, James P. and Arthur van Soest "Vignettes and Self-Reported Work Disability in the US and the Netherlands," *American Economic Review* 97(1):461-473, March 2007

Lillard Lee. and Constantive Panis (1996) "Marital Status and Mortality: The Role of Health" *Demography* , Vol. 33, No. 3 (Aug., 1996), pp. 313-327

Mare, R. D. (1991). Five decades of educational assortative mating. *American Sociological Review* 52; 15-32.

Monden, C. (2007), Partners in health? Exploring resemblance in health between partners in married and cohabiting couples. *Sociology of Health & Illness*, 29: 391–411. doi: 10.1111/j.1467-9566.2007.01003.x

Oreffice, S., and C. Quintana-Domeque (2010) "Anthropometry and socioeconomics among couples: Evidence in the United States," *Economics & Human Biology*, Elsevier, vol. 8(3), pages 373-384,

Pencavel, John. (1998) "Assortative mating by schooling and the work behavior of wives and husbands". *American Economic Review*; 88; 326-329.

Smith, James P. "The Impact of Childhood Health on Adult Labor Market Outcomes," *Review of Economics and Statistics* 91(3):478-489, August 2009.

Smith, James P. "Re-constructing Childhood Health Histories," *Demography*. Volume 46(2):pp. 387-403, May 2009.

Silventoinen, K., Kaprio, J., Lahelma, E., Viken, R.J., and Rose, R.J. (2003) "Assortative mating by body height and BMI: Finnish twins and their spouses". *Am. J. Human Biol*. 15:620–627.

Tambs K, Moum T, Eaves L, Neale M, Midthjell K, Lund-Larsen PG, Naess S, Holmen J.(1991) Genetic and environmental contributions to the variance of the body mass index in a Norwegian sample of first and second-degree relatives. *Am J Hum Biol* 3:257–267.

Tambs K, Moum T, Eaves LJ, Neale MC, Midthjell K, Lund-Larsen PG, Naess S. (1992) Genetic and environmental contributions to the variance of body height in a sample of first and second degree relatives. *Am J Phys Anthropol*. 88:285–294.

Wilson SE. (2002) "The health capital of families: an investigation of the inter-spousal correlation in health status". *Social Science and Medicine* 55(7):1157–1172.