Comparing the benefits of cohabitation and marriage for health in mid-life: is the relationship similar across countries?

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Previous research has found that marriage conveys benefits to individuals, but with recent increases in cohabitation, it is no longer clear that marriage per se matters, compared to living in a co-residential partnership. It is also unclear whether this association is consistent across countries with widespread cohabitation, such as Australia, the UK, the US, Norway, and Germany. Here we compare differences between married and cohabiting men and women with respect to self-rated health in mid-life. Our surveys - the Australian HILDA, Norwegian GGS, UK BCS70, US NLSY, and German SOEP - include a mix of longitudinal and retrospective questions, allowing us to examine socio-economic background and family structure in childhood before entrance into union to better understand selection mechanisms. Using OLS regression, we examine whether self-rated health differs between cohabiting and married couples. Results show no differences between the self-rated health of cohabiting and married people in Australia Norway, and Germany. In the UK and US, however, marriage is significantly associated with better health, although much of the association disappears when accounting for childhood disadvantage, union duration, and childbearing.

A large body of literature has found that marriage provides benefits to individuals (see Waite and Gallagher 2002, Wood et al 2007, particularly with respect to health (Hughes and Waite 2009, Umberson 1992, Lillard and Waite 1995, Mirowsky and Ross 2003, Williams et al 2011). Many prior studies, however, have compared the married with the unmarried, without distinguishing between those who are cohabiting, divorced, widowed, or never married. The recent increase in cohabitation and its new prominence as a normative partnership type raises questions about whether cohabitation provides the same health benefits as marriage. Cohabitation has taken on many of the functions of marriage, for example, providing intimacy, support, social networks, and increasingly, childbearing (Cherlin 2004, Perelli-Harris et al 2012.). As a result, cohabitation may provide many of the same advantages to health that marriage does and may result in similar outcomes.

Nonetheless, whether marriage and cohabitation provide similar benefits may depend on the context that shapes the meaning of cohabitation and marriage. To see how context matters, we study five countries that have recently experienced increases in cohabitation but vary across welfare-state policies, legal approaches to cohabitation, and social norms: the United States, the United Kingdom, Australia, Norway, and Germany. Previous research has suggested that the meaning of cohabitation, and the social emphasis on marriage, differs across these countries (Perelli-Harris et al 2014, Hiekel et al 2014, Smock et al 2005, Miller et al 2011), While the differences are to some degree associated with the prevalence of cohabitation (Heuveline and Timberlake 2004), distinct social, political, and cultural contexts have shaped views on cohabitation and partnership behavior (Perelli-Harris et al 2014, Lappegard and Noack 2015, Berrington et al 2015). The U.S. and the U.K. have a similar history of early nonmarital childbearing, as well as a negative educational gradient of cohabitation, indicating that cohabitation is associated with disadvantage (Ni Bhrolchain and Beaujouan 2013, Berrington and Diamond 2000). These countries also have welfare systems

that employ targeted, means-tested benefits for single mothers (Brady and Burroway 2012) and few laws regulating cohabitation (Bowman 2010, Barlow 2014). Norway, on the other hand, has a much longer history of cohabitation; nearly 90% of unions that eventually have children start with cohabitation (Perelli-Harris et al 2012). Norway's social-democratic welfare-state, which focuses on gender equality and individual autonomy and regulates cohabitation, may have facilitated the increase in cohabitation (Noack 2010). Australia falls in between the two types of regimes; although it has many similarities with the other English-speaking countries, it tends to have more liberal social policies and has made greater strides towards regulating cohabitation (Kovacs 2009). Germany is also unique; eastern Germany has a long history of nonmarital fertility (Goldstein and Kluesener) and very high cohabitation rates, while western Germany's male breadwinner model has kept cohabitation much lower. Thus, the relationship between marriage and health may differ across these contexts.

Marriage may be positively correlated with health due to causation or selection (Brown 2010, Hofferth 2005, Waite 1995). The causation hypothesis suggests that marriage is protective and promotes better health, because married couples provide each other with emotional and social support (Ross 1995, Umberson et al 2010), monitor each other's behavior (Waite and Gallagher 2000), and pool economic resources leading to economies of scale (Waite 1995). In principle, these factors could provide similar protection for cohabiting couples; however, the legal and symbolic status of marriage in a given context may still signify greater commitment and protection for married people. The selection hypothesis states that healthier people with greater socio-economic resources and childhood stability are selected into marriage (Ross and Mirowsky 2013). This argument is usually put forth in the U.S. and the U.K., where cohabitation is selective of socio-economic disadvantage (Smock 2000, Berrington and Diamond 2000). In other contexts, cohabitation could be associated

with higher education, especially in places where the highly educated were early adopters of cohabitation (Surkyn and Lesthaeghe 2004, Lesthaeghe 2010). On the other hand, cohabitation may not be selective of any particular factor, but instead practiced widely. Hence, the social and legal context of a country may influence the degree to which marriage is more selective or protective than cohabitation.

Here we investigate whether men and women in marital unions have significantly better self-rated health in mid-life than those in cohabiting unions. We study mid-life, because most individuals have already made decisions about whether to marry even if they postponed marriage, and cohabitation in this age-range is understudied, especially cross-nationally. We are particularly interested in examining selection that occurs before partnership formation; i.e. childhood conditions that may select people into different types of unions. We use OLS regression models to examine 1) whether the association between marriage and health significantly differs from the association between health and cohabitation in each country and by gender; and 2) whether adjusting for region of birth and ethnicity, family structure in childhood, and socio-economic status of parents, eliminates significant differences between cohabitation and marriage. We also add mediator events that occur in adulthood which may directly affect health, for example experience of union dissolution and number of children, but because we are primarily interested in examining variables exogenous to partnership formation, we focus on conditions that occur in childhood and keep intervening mechanisms to a minimum. In this way, we can compare basic associations across countries to see whether and in what context partnership type matters.

THEORETICAL BACKGROUND

Benefits to cohabitation and marriage

Living in an intimate partnership, regardless of whether it is marriage or cohabitation, may provide advantages that could directly influence health. By living together, couples can benefit from shared resources, sexual and emotional intimacy, companionship, and daily interaction (Waite 1995). Couples who live together often provide each other with care and monitor each other's health behaviors, for example nagging each other to go the doctor or maintain a healthy lifestyle (Umberson et al 2010, Musick and Bumpass 2012). Through social ties, they link each other to broader networks, which can instill a sense of kinship and responsibility (Ross 1995, Umberson and Montez 2010). Although some poor-quality relationships may result in strain and stress (Umberson et al 2006), in general co-residential relationships can provide positive psychosocial benefits by offering social support and conveying symbolic meaning to one's life (Umberson and Montez 2010). Hence, living in a partnership rather than the type of partnership may be what is most important to health.

On the other hand, the official act of marriage may convey unique benefits to health. With a public vow and a legal contract, marriage usually signals a higher commitment between the partners -- to family, friends, and strangers, but also to each other (Wiik et al 2009, Berrington et al 2015, Cherlin 2004). Married people may have a stronger sense of the long-term prospects of their relationship, since marriage is usually intended for life. Those outside the relationship may find it easier to understand the spouses' commitment, and therefore provide greater social support (Marcussen 2005). Marriage's "enforceable trust" (Cherlin 2000) may persuade couples to work harder on their relationships, especially during stressful periods. In addition, marriage may provide a sense of security and well-being. Focus group respondents throughout Europe and Australia mentioned dimensions of marital security that generally did not apply to cohabitation, for example emotional reassurance in a relationship; financial stability; security for their children; and the comfort of not being alone in old age (Perelli-Harris et al 2014). This sense of security may be bolstered by the

additional level of legal protection that marriage provides in some countries (Perelli-Harris and Sanchez Gassen 2012). Thus, the higher commitment of marriage may reduce life uncertainty and increase general well-being, which could then have positive effects on health (Liu and Umberson 2008). On the other hand, men and women may stop caring as much about their physical attractiveness when they enter into marriage. A German study found that cohabitation and marriage are associated with reduced weekly physical activity for men and women (Rapp and Schneider 2008).

Gender differences

Men and women may receive different benefits from being in a partnership or marriage (Liu and Umberson 2008). Previous studies have argued that marriage provides men with more social support and control of their behavior, thereby positively influencing their health (Ross et al 1990). Women supposedly benefit from marriage because of higher economic resources that can keep them healthy (Waite 1995). If men benefit more from social and emotional support and sexual intimacy, then cohabitation may provide similar advantages to marriage. If women benefit more from the financial security of a partnership, they may benefit more from marriage, especially because many women reduce employment hours and become more finically dependent on their spouses around the time of childbearing. Thus, the marital contract may provide women with greater stability and have more long-term rewards to health than cohabitation.

Selection effects

A positive association between marriage and better health may not indicate a causal relation, but instead be the result of selection; individual characteristics and prior experiences

select healthier people into marriage. In this paper, we focus on selection factors that influence partnership choices before entrance into union, in particular parental socio-economic status and family structure in childhood. The experience of childhood adversity may influence both adult relationships and future health through the accumulation of disadvantage and stress over the life course (Ben-Shlomo and Kuh 2002, Hayward and Gorman 2014, Umberson et al 2014). In addition, childhood may be a sensitive period during which significant stress or adversity triggers psychological or physiological reactions leading to chronic disease and/or life-long poor health (Umberson et al 2014, Haas 2008). Thus, controlling for childhood conditions before entrance into adulthood may be sufficient for explaining differences in the association between marital status and health.

In many countries, father's low social class and childhood poverty are associated with poor adult health (Luo and Waite 2005, Kuh et al 2004, Haas 2008). Childhood deprivation may also result in fewer resources and skills in adulthood, which may hamper individuals from finding a suitable marriage partner or achieving the perceived economic bar necessary for marriage, leading them to choose cohabitation instead (Oppenheimer 2003, Berrington and Diamond 2000, Smock 2000). Parental divorce may also be an important selection characteristic for cohabitation. Those who experienced parental divorce may be jaded with the institution of marriage or not want to risk the financial, social, and emotional costs of divorce (Axinn and Thornton 1996, Liefbroer and Elizinga 2012, Perelli-Harris et al 2015). On the other hand, those whose parents divorced may have lower well-being in adulthood (Kuh et al 2004), which may be one of the underlying reasons why cohabitors have worse health than married individuals.

Differences across countries

Cultural, economic, and legal factors have produced differential rates of increase in cohabitation, as well as different associations between cohabitation and well-being. Social and political developments alter historical kinship systems and produce ideational change that leads to the practice of new behaviors (Lesthaeghe and Surkyn 2002, Lesthaeghe and Neels 2002). Depending on starting conditions and subsequent social change, the diffusion of new behaviors moves quickly through some societies, but takes much longer in others. Policy developments may have exacerbated the increase in cohabitation in some countries, although the increase in cohabitation may also have prompted changes in legislation. Some welfare states recognize cohabitation as an alternative to marriage, providing many of the same rights and responsibilities, for example similar tax benefits, access to courts upon union dissolution, or parental rights to child custody (Perelli-Harris and Sanchez Gassen 2012). The welfare state may also influence partnership decisions. On the one hand, single mother benefits and tax penalties for low-income married couples may encourage women to stay unmarried in order to maintain their eligibility for benefits. On the other hand, tax incentives that promote a breadwinner model may encourage people to marry. Thus, policies and laws may influence people's decisions about marriage and cohabitation.

In addition, new behaviors also diffuse at differential rates among different strata of a society. In some countries, cohabitation began among the well-educated avant-garde, while in others cohabitation was characterized as a "poor man's marriage" (Perelli-Harris et al 2010, Kiernan 2004). Over time, selection processes may have changed, especially with the increase in higher education, changing labor market participation, and globalization. Recently, Perelli-Harris et al (2010) found that childbearing within cohabitation is associated with lower education throughout Europe and the United States, suggesting that those with more precarious labor market positions choose to have children in relationships which are potentially less stable. Nonetheless, the strength of the association as well as the prevalence

of cohabitation in a society produces stronger or weaker selection effects. Taken together these processes have resulted in cohabitation becoming associated with varying degrees of selection effects across countries. Below we provide greater details on the cultural, legal, and selection effects context for the countries in this study.

Marriage in the U.S. tends to have a special status, especially compared to other countries where cohabitation is often perceived as equivalent to marriage (Cherlin 2009). Although cohabitation has increased rapidly over the past decades, the majority of those born in the 1970s had married by their 40s (Kennedy and Bumpass 2008). Those who did not marry were usually the most disadvantaged, as cohabitation in the U.S. has been highly selective of the poor and less educated (Kennedy and Bumpass 2008) and associated with poor relationship quality (Brown and Booth 1996), depression (2000), physical violence and abuse (Kenney and McLanahan 2006). Most studies show strong health benefits to marriage (Waite and Gallagher 2000), although many of these studies do not distinguish between those who are cohabiting and married, and a recent study that does compare partnership types finds that after accounting for unobserved heterogeneity, differences are small (Musick and Bumpass 2012). For the most part, US law does not recognize cohabitation; no states have passed legislation on unmarried partners (Bowman 2010). Welfare state policies, however, tend to privilege low-income single mothers, and single-mother benefits may in fact discourage marriage (xxx). All in all, selection effects in the U.S. combined with a context that legally and socially favors marriage may result in a negative association between cohabitation and health. Once selection effects are accounted for, however the difference in self-rated health for cohabiting and married individuals may disappear.

The situation in the UK is similar, although the emphasis on marriage as the utmost ideal is less strident. Since the 1970s, the prevalence and duration of cohabitation in the U.K. has been increasing rapidly. Around 84% of those married in 200x had previously lived

together before marrying, usually for around four years (Beaujouan and Ni Bhrolchain 2011). Long-term cohabitation, however, is less common; only 10% of cohabiting couples were still together after 10 years; about half of the remainder married, and 40% separated (Beaujouan and Ni Bhrolchain 2011). Thus, while cohabitation is socially acceptable and the majority of the population perceives few differences between cohabitation and marriage (Duncan and Philips 2008), marriage is generally considered a more committed union and preferred by most (Berrington et al 2015). The legal situation in England and Wales still reflects this preference for marriage; cohabiting couples are unable to access family courts upon union dissolution and have to pay inheritance tax when one partner dies (Perelli-Harris and Sanchez Gassen 2012). Given the negative educational gradient for entering into cohabitation and having a birth within cohabitation (Ni Bhrolchain and Beaujouan 2013, Perelli-Harris et al 2010), the lack of legal protection is disproportionately likely to influence those who are less educated. Single-mother benefits in the UK, on the other hand, may not only discourage marriage, but also co-residential partnerships; qualitative research revealed that women on benefits were aware of how many nights their partner could spend the night before losing their benefits (Berrington and Trevena 2014). Overall, we expect that as in the U.S, cohabitation in the UK will be associated with lower self-rated health, but controlling for childhood background characteristics will be sufficient for removing the selection into cohabitation.

In many ways, Australia has had the same Anglo-Saxon development of family behaviors as the U.S. and U.K., but recently some of the legislative and social developments may have produced differences. As in the U.K. and U.S., the majority of first co-residential unions starts with cohabitation (Evans 2012), which is widely accepted (Evans and Gray 2005; Qu and Weston 2008). Nonetheless, qualitative research has continued to demonstrate the importance of marriage, especially as the pinnacle of live-in relationships (Evans report,

Carmichael and Whittaker 2007). Recently, studies have found a weak social selection into marriage; highly educated women are more likely to be married than women with lower levels of education (Heard, 2011 Evans 2015; Hewitt and Baxter, 2012). Throughout the 1980s and 90s, lawmakers changed policies to provide cohabiting couples the same rights and responsibilities as married couples. In 2009, the family law act was amended to give couples living together for 2 years or having a child together the same access to the courts in relation to property and spousal maintenance on separation (Family Law Amendment (De facto Financial Matters and Other Measures) Act 2008). Access to government welfare payments, on the other hand, is calculated based on household income, which may discourage some couples from moving in together. Thus, although there is weak selection into cohabitation and a slight social preference for marriage, the legal and social acceptability of cohabitation in Australia leads us to expect few differences in the mid-life health of cohabiting and married individuals.

Cohabitation in Norway has generally developed more rapidly and extensively than in the English-speaking countries. By xxxx, 90% of all co-residential unions started with cohabitation (Dommermuth and Wiik 2014), and in xxxx among individuals under 30, three out of four couples were cohabiting (Noack, Bernhardt, and Wiik 2013). Research has shown that childbearing within cohabitation had a negative educational gradient (Perelli-Harris et al 2010), but now that more births occur within cohabitation than marriage, selection effects are diminishing. Over the past few decades, the legal system gradually provided cohabitors with similar rights to married couples, particularly those having children together, and more recently those that have been in long-term unions. Recently, the focus has shifted to provide cohabitors with inheritance rights, but unlike married couples, cohabitors still need to have a will or cohabitation contract to inherit from each other (Noack 2010). Nonetheless, although cohabitation is generally considered equal to marriage, socially and legally, many still prefer

marriage, especially as a way of formalizing the commitment of parenthood or expressing the ultimate romantic gesture towards each other (Lappegard and Noack 2015). Thus, although cohabitating and married individuals may be similar to each other in many ways, and with respect to self-rated health, it is important to keep in mind that marriage in Norway is unlikely to disappear anytime soon (Lappegard and Noack 2015).

In Germany, as in the other countries, cohabitation has also increased rapidly, but the eastern and western parts of the country still differ considerably. Despite shared institutional and political conditions since reunification in 1990 and the alignment of other family behaviors, such as fertility and divorce, the prevalence and meaning of cohabitation remains very different (Goldstein and Kluesener, Klaerner 2015). Differences are especially apparent for childbearing in cohabitation: in the east, 74 per cent of first births in 2009 were to unmarried women, while this was only 36 per cent in the west. By the time of the second birth, however, most mothers are married: 61 per cent in eastern Germany and 85 per cent in western Germany (Goldstein et al 2010). Previous research has shown that highly educated men are selected into marriage, but highly educated women are more likely to be selected into cohabitation, and this likelihood is enhanced by experiences of separation of the parents (Müller et al 1999.) However, for mothers in both parts of the country, a higher educational level increases the likelihood of being married when the first child is born (Kreyenfeld et al 2011; Perelli-Harris et al 2010). People who live together in cohabitation or marriage are also similar with for some health behaviors, but differ from those who do not live with their partner or singles. For instance, those living with a partner smoke less and have a reduced probability of exercising (Klein et al 2013; Rapp and Schneider 2013). Unlike our other countries, social policies and taxation law continue to favor marriage over cohabitation; the advantages of tax splitting and sharing the health insurance of the main earner are limited to married couples only (Konietzka and Kreyenfeld 2002; Perelli-Harris and Sanchez Gassen

2012). Moreover, Germany was one of the last countries in Europe to introduce joint parental responsibility for non-marital children. Overall, we expect that cohabitation in Germany will be associated with lower self-rated health due to social and legal preferences for marriage. However, because of eastern Germany's impact, we expect the differences in married and cohabiting individuals' health to be relatively small and to disappear when accounting for selection effects.

DATA AND METHODS

Data

To examine the effect of partnership experiences on health in mid-life, we employ five nationally representative longitudinal data sets: the British Cohort Study 1970 (BCS70) for the UK, the National Longitudinal Survey of Youth 1979 (NLSY79) for the U.S., the Household, Income and Labour Dynamics in Australia (HILDA) for Australia, the Generations and Gender Survey (GGS) for Norway, and the Socio-Economic Panel (SOEP) for Germany. The British Cohort Study followed children born in the UK in a single week of 1970 and interviewed them or their parents regularly until age 42. The NLSY79 is also a birth cohort survey following a representative sample of individuals born between 1957 and 1964. In 1979, the survey participants were 14-22 years old and they were interviewed annually through 1994 and biennially since. HILDA is a nationally representative household-based longitudinal survey. The survey started in 2001 and annually interviews all adults over 15 years old in the selected households. The sample includes new households when household members leave the original household (i.e. through children leaving home, divorce or separation). The Norwegian GGS is a nationally representative cross-sectional survey of respondents aged 18-79 in 2007. It combines information obtained during telephone

interviews and a self-administered questionnaire (SAQ) with data from administrative records. It collected complete partnership histories from the interviews, childbearing histories from the administrative register and childhood background characteristics through an extra battery of questions in the SAQ. The SOEP is a representative longitudinal study of private households which interviews all members of the household (from the age of 15) annually. It started 1984 in West Germany and 1990 in the former East Germany. Individuals who leave the household are followed and all members of the new households are interviewed. Childhood background characteristics, marriage histories and, since 2007, partnership histories, are collected retrospectively when respondents enter the survey and updated in subsequent waves.

Despite slightly different designs, all five surveys provide information on the partnership histories of respondents, self-rated health in mid-life, and childhood background characteristics. Except for the BCS70, the surveys ask questions about childhood retrospectively, although for the US, the time elapsed since childhood until age 14-22 when the initial survey was conducted was relatively short. The partnership histories in the BCS70 were first asked when survey participants were 34 and updated at following waves. In the NLSY79 the partnership histories were asked prospectively at each wave. In HILDA the partnership histories were asked retrospectively at first wave in 2001 and updated in the following waves. In the GGS all information about partnerships was retrieved retrospectively in 2007. Well-being outcomes were measured at the time of interview. We are interested in mid-life outcomes, and thus we selected respondents in their forties, depending on sample size. The well-being of British respondents was assessed in 2012 when they were 42; the US respondents were asked for their well-being in the age range 39-49 (1998-2006); the analytic sample for Australia and Germany is comprised of people aged 38-48 whose outcome was measured in 2013, and for Norway respondents were aged 38-50 in 2007. Applying these

restrictions leaves us with the sample of 9841 respondents in the UK, 4927 in the US, 2833 in Australia, 2785 in Norway, and 3614 in Germany.

Measures

Dependent variables. Our dependent variable is self-rated health. Self-rated health is associated with current and future physical and mental health conditions, and it is recognized as a reliable and valid indicator of general health (Ferraro and Farmer 1999, Hardy, Acciai and Reyes 2014). In all surveys, health is self-assessed and measured with a single question ("In general, would you say your health is") on a five-level scale with responses: 1 = *poor*, 2 = *fair*, 3 = *good*, 4 = *very good*, 5 = *excellent*. The responses for all countries were originally in reverse order but were recoded so that higher values denote better health. Because self-rated health has context-specific meanings (Grol-Prokopczyk, Freese and Hauser 2011), we do not directly compare measures across countries, but keep all analyses specific to each country.

Partnership type. Our main variable of interest is whether respondents reported currently being in a cohabiting or marital union. For the NLSY79, union status was reported during 1998-2006 when respondents were 39-49 years old; for the BCS70 union status was measured in the latest wave in 2012 when respondents were 42 years old; for HILDA union status was measured in 2013; for the Norwegian GGS union status was reported in 2007; and for the SOEP union status was measured in 2013.

Childhood characteristics. The models include a range of childhood background characteristics (table 1). Based on findings from previous literature (Smock 2000, Berrington and Diamond 2000; Blanchflower and Oswald 2004; Teachman 2003), we distinguished four dimensions important both for union formation behavior and well-being outcomes: region or current place of residence; ethnicity; family structure in childhood; and parental socio-

economic status. We aimed to harmonize the variables covering each of the dimensions; however this was not always possible, either because some variables were not available for all countries, or because some variables were relevant only for some countries, such as race and ethnicity. However, because our goal was to create analyses appropriate for each country, we feel that this was the most valid approach.

(Table 1 about here)

Family formation experience. Duration of the current union, whether current union was the first or later union, and the number of children can also affect self-rated health. We included measures of family formation as controls in the regression models. Current union duration was entered as a quadratic term to allow for non-linear duration dependence; previous union, or the experience of union dissolution, was entered as a binary indicator; and number of children distinguished between having no children, one child, two children, and three or more children.

Analytical approach

We carry out the analysis by employing Ordinary Least Squares regression on self-rated health.[1] Although the outcome variable can also be considered an ordinal or categorical variable, we use OLS because it provides the easiest comparison across countries and the other methods would require arbitrary cut-off points and re-coding. We regress the outcome variable on the indicator of union type and different sets of controls including age of the respondent, selection factors linked to childhood experience, and the characteristics of his or her family formation biography. Our analytical approach is presented graphically in Figure 1.

(Figure 1 about here)

[1] We also ran Propensity Score Models to see if results varied by the propensity to be in a cohabiting or marital union, but the PSM results did not differ from the OLS models, and OLS provides the opportunity to include mediator variables such as prior union dissolution and number of children.

We apply a sequential approach by first running a regression that includes only the union type and respondent's age to estimate the difference between married and cohabiting individuals net of the age effect, since health tends to deteriorate over age. We then add a set of covariates describing childhood characteristics to control for selection mechanisms into a particular type of union. The childhood characteristics are exogenous, because they refer to the time before respondents started their union formation experience. Finally we add a set of controls that capture the respondent's experience of family formation. We selected characteristics that are potentially linked to self-rated health in mid-life: duration of the current union, experience of union separation, and number of children. Those characteristics are not strictly exogenous and may reflect the pathway through which marriage and cohabitation influence self-rated health. The sequential addition of the control variables allows us to observe how the variables mediate the differences in self-rated health between married and cohabiting respondents.

RESULTS

Table 2 compares the mean self-rated health of men and women by current partnership type for those currently in a partnership in mid-life across all five countries. First, note that the percent of men and women in cohabitation is roughly similar across countries, from about 10% of American women to about 22% of British men. Some of the differences in magnitude may be due to the different years in which the surveys were conducted, as well as different age ranges. The confidence intervals indicate that in the UK and the U.S. mean self-rated health scores are higher for married men and women compared to cohabiting men and women. German married women also have higher self-rated health than their cohabiting counterparts. However, mean self-rated health does not differ significantly by union type in Australia and Norway.

(Table 2 about here)

Table 3 summarizes the results of the Ordinary Least-Squares models for self-rated health by gender, showing the coefficients that indicate whether an individual was cohabiting or married at the time of the most recent interview. (Appendix A presents the full models including all covariates separately for each country). The baseline model controls for age in the US (39-49), Norway (38-50), Australia and Germany (38-48) – in the UK all respondents were age 42 at the time of the survey. Each subsequent model includes an additional set of control variables (see Appendices for specific controls included in each country).

We can immediately see that in Norway and Germany[2], cohabiting and married men reported no significant differences in self-rated health at mid-life, supporting our hypothesis that differences by union type would be minimal in these countries. In the US, UK, and Australia, however, cohabiting men had significantly worse self-rated health than married men when only controlling for age; the coefficient for the three countries is around 0.21, indicating a similar magnitude of effect. We then include the battery of questions regarding childhood background, including region and ethnicity, parents' socio-economic status, and family structure (see Table 1). These variables resulted in a decline in the magnitude of the coefficients in a similar way in the three countries, to around 0.15. The p-values indicate a significant difference in self-rated health at the .05 level in the U.S. and at the .001 level in the UK, but no significant differences in Australia, although this may be due to small sample size, since the magnitude of the coefficient is similar to that in the US and UK.

When union duration is included in the men's models, the OLS coefficients decline to around 0.9 in the U.S. and Australia, and they are no longer significant at the .05 level. In the

[2] In order to keep the analyses consistent between countries we do not distinguish between eastern and western Germany with separate models. However, when we exclude East Germans from our analyses the results were similar to those from Australia. Cohabiting men have significantly worse self-rated health than married men, but differences are eliminated when controlling for the number of children. Women in West Germany, however, show no significant differences in self-rated health by union status.

UK, however, the magnitude of the coefficient increases, indicating a slightly larger difference in self-rated health by union type after controlling for union duration. The relatively high magnitude persists in the UK even after controlling for previous unions and number of own children, implying substantial health differences between cohabiting and married men in Britain.

The results for American and British women are similar to those for American and British men. In the US, the baseline models reveal a relatively large difference between cohabiting and married women, but again, including childhood conditions substantially reduces differences. Union duration eliminates any remaining differences between cohabiting and married women in the US. In the UK, the difference between cohabiting and married women starts out at a lower magnitude than for British men, drops once childhood background conditions are included to the 0.05 significance level, and declines even further once union duration is included. Thus, the results in all countries suggest that cohabiting and married women have similar health outcomes in mid-life, once childhood characteristics and union duration are taken into account. Australian women are more similar to Norwegian and German women, with no significant differences in self-rated health for cohabiting and married women. In some cases, the magnitude of the coefficients is even negative, hinting that cohabiting women may have better health than married women, but the lack of significance overall indicates no major differences.

DISCUSSION

A large body of literature has shown that married individuals have better health outcomes than unmarried individuals (Waite 1995, Waite and Gallagher 2000, Liu and Umberson 2008), and some claim that marriage has a direct causal effect on well-being (Waite 1995, Waite and Gallagher 2000). However, the majority of these studies did not

directly compare the cohabiting with the married or investigate whether the relationship between marriage and health holds outside of the U.S. Our study finds that differences between cohabitation and marriage strongly depend on context, as well as gender, the length of the union, and childhood background characteristics which could select individuals into a particular type of union.

As expected, the results show that the health of cohabiting and married couples in mid-life does not differ substantially in Norway, a country which has had a long history of cohabitation, a focus on gender equal policies, and a movement towards legally equalizing cohabitation and marriage (Noack 2010). Note, however, that the majority of survey respondents in this age range were married by the time of the survey, indicating that those who were still cohabiting in mid-life may still be somewhat selective. Qualitative research has revealed that although Norwegians tend to think that cohabitation and marriage are indistinguishable, and parents do not necessarily need to marry when they have children, most people eventually marry for symbolic or romantic reasons (Lappegard and Noack 2015). Thus, although cohabitation may not be associated with lower self-rated health in Norway, cohabitors may differ from married people along other dimensions.

The results for Germany are similar to Norway and support our hypothesis that married and cohabiting individuals differ little with respect to self-reported health. Again, a relatively small proportion are cohabiting in mid-life indicating this may be a selective group. The similarities to Norway may partly result from the inclusion of eastern Germany, where the status of cohabitation is more accepted as an alternative to marriage than in western Germany (Perelli-Harris et al. 2014; Hiekel et al. 2015, Klaerner 2015). Our findings corroborate recent research showing similarities in health-related behavior between cohabiting and married couples in Germany, although some of the outcomes positively impact health, for example declines in smoking (Klein et al 2013), and others negatively

impact health, for example reduced physical exercise and increased body mass index (Rapp and Schneider 2013, Klein et al 2013).

Also as expected, we found significant differences between the self-rated health of cohabiting and married men and women in the U.S. and the U.K., corroborating previous studies which found a strong association between marriage and positive health outcomes (e.g. Liu and Umberson 2008). The U.S. and U.K. share a similar cultural background and history of means-tested welfare benefits that have disproportionately supported low-income single mothers (Brady and Burroway 2012). Cohabitation in these countries tends to be highly selective of those with low education and disadvantaged parental background (Steele et al 2006, Smock 2000, Kennedy and Bumpass 2008). Indeed, controlling for socio-economic status and family structure in childhood reduces differences in self-rated health by partnership. Nonetheless, the differences remain significant, suggesting that the selection mechanisms we investigate could be insufficient; other selection mechanisms such as poor health in childhood, or those which operate in adulthood such as educational attainment or employment, may be more likely to eliminate differences. Indeed, another study using the BCS70 found that including educational aspirations and psychological attributes eliminates differences in mental well-being by partnership type (Perelli-Harris and Styrc 2015). Hence, further research is needed to better understand the source of selection in these countries.

The length of the union does eliminate differences for American men and women and British women: the longer the union, the more likely health differentials disappear. Although sample size shrinks for longer cohabiting unions, which may be responsible for the non-significant results, the coefficients nonetheless suggest that cohabiting unions become more similar to marital unions over time, (or selection effects become less relevant over time). Previous research has also found that union duration reduces or eliminates differences between cohabitation and marriage, for example in the pooling of financial resources

(Lyngstad et al 2011). Over time, couples may invest more in a relationship, become more dependent on each other, but also provide more support, which could have positive health benefits. In addition, longer unions may reflect higher relationship quality, with poor quality unions dissolving. Thus, one of the reasons for the association between poor health and cohabitation may not be the lack of official marriage, but instead the higher likelihood of union dissolution among cohabitors. Nonetheless, British men seem to be an exception to this finding: the effects of union duration do not cause differences between cohabitation and marriage to disappear and may even marginally increase differences. Men in long-term cohabiting unions may be even more select, because they do not take the normative step of marriage, perhaps due to lack of resources or permanent unemployment.

The results for Australia lie between the other Anglo-Saxon countries and Norway, highlighting how results can differ by gender. As in the U.S., Australian cohabiting men have worse self-rated health than married men, and childhood background explains some of the differences. The lower health status of cohabitation may be reflecting some of the disadvantages that Australian men face; for example, they may not marry because of difficulties in the labor market, lack of resources and social capital, as well as poor health. In Australia, union duration again eliminates most of the association between union status and health for men, suggesting that the type of union does not matter as much as the length. Australian women, on the other hand, have insignificant differences in self-rated health by union type. Either cohabiting women in Australia are a less selective group, or any selection that does occur does not manifest itself in poor health. In any case, both the Australian and UK results suggest that the association between marriage and health can vary by gender, as found in other studies (xx).

The study, and each survey, has limitations that must be noted. Because the UK BCS70 follows respondents from birth, it more accurately measures childhood characteristics

but suffers from attrition; while some of the independent variables can be imputed, the dependent variable (self-rated health) and current union status cannot, potentially biasing the representativeness of the sample. The other surveys have fewer missing values, but rely primarily on retrospective measures of childhood, which may not be as accurately reported. In addition, the measures in the surveys often do not precisely match each other; while we have tried to harmonize the variables as much as possible, differences in measurement still remain. We also decided to include context-specific variables that may be included in one country but not applicable in another, for example race or ethnicity, which may again produce differences in the models. Ultimately, the models are subject to the accuracy of the survey measures and can only capture effects within a country, which means we cannot directly compare results across countries.

Finally, it is important to reiterate that our study focuses on partnership status in mid-life, after the main period of entrance into first partnership and after most decisions about marriage have already occurred, especially those that occur jointly with childbearing decisions. Cohabitors at these ages may not be representative of all cohabitors, especially those who cohabit before marriage or have short unions more similar to dating relationships (Heuveline and Timberlake 200x). Nonetheless, it is still important to analyze this age range because it is often understudied, and it is a crucial age for the appearance of health differentials. We find stark differences in health differentials by partnership type, but only in Anglo-Saxon countries, suggesting that the association between union status and health depends on policy and cultural context. However, we also find that selection effects based on childhood conditions and investments into the union can reduce these differentials. Hence, our study sheds light on how the meaning and implication of cohabitation differs across societies.

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Figure 1. Analytic approach

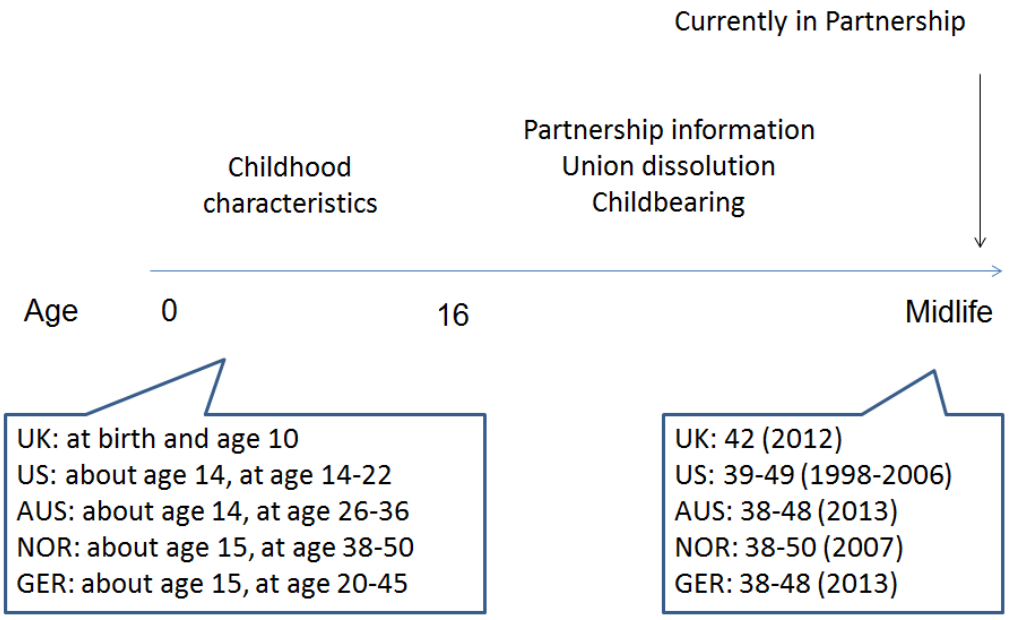

Table 1. Background childhood characteristics (in brackets, the year when the data was collected)

Domain	UK	US	Australia[4]	Norway	Germany[4]
Region and ethnicity	(1970) Region of residence at birth: - Scotland, Ireland and North - Midlands and Wales - South West - South East and East	(1979) Resided in South at 14 (N/Y)		(2007) Region of residence until age 15: - Oslo area - East area - South and West - Mid- and North	(1984) Region of residence at birth: - Germany (West Germany before re-unification) - Germany (East Germany before re-unification) - Outside Germany
	(1970) Any parent born outside of the UK (N/Y)		(2001) Any parent born outside Australia (N/Y)	(Register)[1] Any parent born outside Norway (N/Y)	(1984) Any parent born outside Germany (N/Y)
			(2001) Respondent born outside Australia (N/Y)		

		(1979) Race: - Non-Hispanic Black - Hispanic - Non-Hispanic White	(2001) Aboriginal or Torres Strait Islander (N/Y)		
			(2001) English first language learned		
Family structure in childhood	(1980) Lived with both biological parents at age 10 (N/Y)	(1979) Lived with mother and father at 14 (Y/N)	(2001) Lived with both parents at age 14 (N/Y)	(2007) Lived with both parents at age 15 (Y/N)	(1984) Lived with both parents during first 15 years of childhood (Y/N)
			(2001) Parents separated at age 14 (N/Y)		
	(1970) Mother's age at respondent's birth: - less than 20 years - 20-24 years - 25-29 years - 30 years and over	(1979) Mother's age at respondent's birth: - less than 20 years - 20-24 years - 25-29 years - 30 years and over		(2007) Mother's age at respondent's birth - less than 20 years - 20-24 years - 25-29 years - 30 years and over	(1984) Mother's age at respondent's age - less than 20 years - 20-24 years - 25-29 years - 30 years and over
	(1980) Number of siblings at age 10: 0, 1, 2, 3 or more	(1979) Number of siblings: 0, 1, 2 or more		(2007) Number of siblings reported at interview: 0, 1, 2, 3 or more	(1984) Number of siblings reported at interview: 0, 1, 2, 3 or more

SES of parents	(1980) Mother's education: - low - medium - high - missing - no mother figure in the household	(1979) Mother has less than high school degree (N/Y)	(2001) Mother's schooling: - none or primary - some secondary - complete secondary (2001) Mother's post school qualification: - university - TAFE - other - no post school qualifications	(2007) Mother's education: - low - medium - high	(1984) Mother's education: - low - medium - high
	(1980) Father's education: - low - medium - high - missing - no father figure in the household	(1979) Father has less than high school degree (N/Y)	(2001) Father's schooling: - none or primary - some secondary - complete secondary (2001) Father's post school qualification: - university - TAFE - other - no post school qualifications	(2007) Father's education: - low - medium - high	(1984) Father's education: - low - medium - high
	(1980) Father worked when respondent was 10 (N/Y)		(2001) Father ever unemployed for at least 6 months while respondent was growing up		
	(1980) Mother worked when respondent was 10 (N/Y)	(1979) Mother worked when respondent was 14 (N/Y)		(2007) Mother worked when respondent was 15 (N/Y)	(1984) Mother worked when respondent was 15 (N/Y)

	(1980) Father's occupation when respondent was 10: - managerial and professional - intermediate - routine and manual occupations	(1979) Father's occupation when respondent was 14: - managerial and professional - intermediate - routine and manual occupations - not working	(2001) Father's occupation: - managerial and professional - intermediate - routine and manual occupations	(2007) Father's occupation when respondent was 15: - managerial and professional - intermediate - routine and manual occupations - not working	(1984) Father's occupation when respondent was 15: - managerial and professional - intermediate - routine and manual occupations - not working

[1] (Register) – Based on administrative register data with information about immigration status
[2] – Not used in the current analysis, will be included in future analyses
[3] – Used in the current analysis, will be dropped in future analyses
[4] – Data collected retrospectively at first wave (AUS 2001, GER 1984) or first wave entered for individuals entering in subsequent waves.

Table 2. Percent of those married or cohabiting and mean self-rated health by current union status

		US		UK		Australia		Norway		Germany	
		percent (n)	mean (CI95%)	percent (n)	mean (CI95%)	percent (n)	mean (CI95%)	percent (n)	mean (CI95%)	percent (n)	mean (CI95%)
Men	Married	88% (2428)	3.79 (3.75,3.83)	78% (2486)	3.72 (3.68,3.76)	85% (803)	3.46 (3.40,3.53)	84% (775)	3.79 (3.71,3.86)	86% (1500)	3.61 (3.56,3.65)
	Cohabiting	12% (322)	3.57 (3.46,3.68)	22% (701)	3.52 (3.44,3.59)	15% (141)	3.27 (3.11,3.43)	16% (147)	3.69 (3.52,3.87)	14% (241)	3.51 (3.40,3.62)
Women	Married	90% (2506)	3.71 (3.67,3.75)	79% (2694)	3.74 (3.70,3.78)	87% (908)	3.52 (3.46,3.59)	85% (953)	3.72 (3.65,3.79)	88% (1642)	3.55 (3.50,3.59)
	Cohabiting	10% (274)	3.46 (3.34,3.59)	21% (705)	3.59 (3.51,3.67)	13% (139)	3.54 (3.37,3.71)	15% (173)	3.75 (3.58,3.92)	12% (231)	3.47 (3.35,3.59)

Source: own calculations with NLSY79, BCS70, HILDA, GGS.

Table 3. OLS coefficients for currently married versus currently cohabiting on self-rated health, (standard errors in parentheses). Full models shown in Appendix.

	Controls	US	UK[a]	Australia	Norway	Germany
Men	Age	0.21*** (0.06)	0.21*** (0.04)	0.22* (0.09)	0.11 (0.10)	0.11 (0.06)
	Age, childhood characteristics	0.14* (0.06)	0.16*** (0.04)	0.15 (0.09)	0.08 (0.10)	0.10 (0.06)
	Age, childhood characteristics, union duration squared	0.09 (0.07)	0.17*** (0.05)	0.09 (0.09)	0.06 (0.10)	0.12 (0.07)
	Age, childhood characteristics, union duration squared, previous unions	0.08 (0.07)	0.17*** (0.05)	0.09 (0.10)	0.05 (0.10)	0.12 (0.07)
	Age, childhood characteristics, union duration squared, previous unions, number of own children	0.08 (0.07)	0.17*** (0.05)	0.09 (0.10)	0.04 (0.10)	0.10 (0.07)
Women	Age	0.25*** (0.06)	0.15*** (0.04)	0.01 (0.09)	-0.011 (0.09)	0.09 (0.06)
	Age, childhood characteristics	0.15* (0.06)	0.11* (0.04)	-0.03 (0.09)	-0.10 (0.09)	0.07 (0.06)
	Age, childhood characteristics, union duration squared	0.10 (0.07)	0.01 (0.05)	-0.07 (0.09)	-0.10 (0.10)	0.09 (0.07)
	Age, childhood characteristics, union duration squared, previous unions	0.09 (0.07)	0.01 (0.05)	-0.07 (0.10)	-0.09 (0.10)	0.11 (0.07)
	Age, childhood characteristics, union duration squared, previous unions, number of own children	0.09 (0.07)	-0.00 (0.05)	-0.06 (0.10)	-0.11 (0.10)	0.08 (0.07)

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

a - controlling for age does not apply to the UK because all respondents are age 42

APPENDIX A. ESTIMATIONS OF THE OLS REGRESSION OF SELF-RATED HEALTH

Table A1. Regression of self-rated health by sex, U.S.

	Men	Women
Married (ref. cohabiting)	0.079	0.091
	(0.07)	(0.07)
Age	-0.035*	-0.026
	(0.02)	(0.02)
REGION AND ETHNICITY		
Resided in South at 14	-0.053	-0.062
	(0.04)	(0.04)
Race (ref. Non-Hispanic White)		
- Black	0.076	-0.15**
	(0.05)	(0.06)
- Hispanic	-0.061	-0.13*
	(0.06)	(0.06)
Mother born outside the U.S.	0.13	0.087
	(0.08)	(0.09)
Father born outside the U.S.	0.023	0.016
	(0.09)	(0.09)
FAMILY STRUCTURE IN CHILDHOOD		
Lived with both parents at 14	0.089*	0.016
	(0.04)	(0.04)
Number of siblings (ref. 0)		
one	-0.07	0.0015
	(0.05)	(0.05)
two or more	-0.049	-0.1
	(0.06)	(0.06)
Mother's age at respondents birth (ref. 20-24 years)		
-less than 20 years	0.0095	0.019
	(0.07)	(0.07)
-25-29 years	0.03	-0.018
	(0.06)	(0.06)
-30 and above	0.056	0.08
	(0.06)	(0.06)
SOCIO-ECONOMIC BACKGROUND OF PARENTS		
Mother has less than high school degree	-0.17***	-0.22***
	(0.05)	(0.05)
Father has less than high school degree	-0.12**	-0.036
	(0.05)	(0.05)
Mother employed when respondent was 14	0.087*	0.072
	(0.04)	(0.04)
Father's occupation during childhood (ref. not working)		
- managerial and professional	0.23*	0.38***
	(0.10)	(0.09)
- intermediate occupation	0.23*	0.26**
	(0.10)	(0.09)

- routine and manual occupation	0.11	0.26**
	(0.09)	(0.09)
RESPONDENT'S FAMILY FORMATION HISTORY		
Duration of current union	0.026*	0.012
	(0.01)	(0.01)
Duration of current union squared	-0.0012*	-0.00046
	(0.00)	(0.00)
Having ever experienced separation	-0.072	-0.076
	(0.05)	(0.05)
No. of own children (ref. 0)		
one	0.023	-0.00055
	(0.07)	(0.07)
two	0.052	0.082
	(0.06)	(0.06)
three or more	-0.039	0.024
	(0.06)	(0.07)
n	2726	2755

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

Table A2. Regression of self-rated health by sex, U.K.

	Men	Women
Married (ref. cohabiting)	0.17***	-0.00051
	(0.05)	(0.05)
REGION AND ETHNICITY		
Region of residence at birth (ref. Scotland, Ireland and North)		
Midlands and Wales	-0.054	-0.078
	(0.05)	(0.05)
South West	-0.011	-0.064
	(0.07)	(0.07)
South East and East	-0.057	-0.041
	(0.04)	(0.04)
At least one parent born out of the UK	0.061	-0.073
	(0.06)	(0.06)
FAMILY STRUCTURE IN CHILDHOOD		
Lived with both biological parents at age 10	0.11	0.12*
	(0.06)	(0.05)
Number of siblings	-0.044*	-0.025
	(0.02)	(0.02)
Mother's age at respondents birth (ref. 20-24 years)		
-less than 20 years	-0.091	-0.037
	(0.07)	(0.07)
-25-29 years	0.024	0.097*
	(0.04)	(0.04)
-30 and above	0.10*	-0.0033
	(0.05)	(0.05)
SOCIO-ECONOMIC BACKGROUND OF PARENTS		

Mother's education (ref. low)		
medium	0.14**	0.11*
	(0.05)	(0.05)
high	0.25**	0.23**
	(0.08)	(0.08)
Father's education (ref. low)		
medium	0.0026	0.13**
	(0.05)	(0.05)
high	-0.024	0.24**
	(0.08)	(0.07)
Mother employed when respondent aged 10	0.047	-0.044
	(0.04)	(0.04)
Father employed when respondent aged 10	-0.26*	-0.19*
	(0.11)	(0.10)
Father's occupation during childhood (ref. routine and manual)		
- intermediate occupation	0.029	0.027
	(0.06)	(0.05)
- routine and manual occupation	0.14	0.015
	(0.07)	(0.07)
RESPONDENT'S FAMILY FORMATION HISTORY		
Union duration	-0.00015	0.0031**
	(0.00)	(0.00)
Union duration squared	-0.000001	-0.000008**
	(0.00)	(0.00)
Having ever experienced separation	-0.069	-0.078
	(0.04)	(0.05)
No. of own children (ref. 0)		
one	-0.0067	0.024
	(0.06)	(0.06)
two	0.038	0.086
	(0.05)	(0.06)
three or more	-0.1	-0.032
	(0.06)	(0.06)
N	3184	3396

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

Table A3. Regression of self-rated health by sex, Australia

	Men	Women
Married (ref. cohabiting)	0.091	-0.061
	(0.10)	(0.10)
Age	-0.032**	-0.023
	(0.01)	(0.01)
REGION AND ETHNICITY		
Respondent born outside Australia	-0.013	-0.10
	(0.11)	(0.11)
Any of the parents born outside Australia	0.064	0.093
	(0.08)	(0.07)

Aboriginal or Torres Strait Islander	-0.49	-0.68**
	(0.33)	(0.21)
English first language learnt	0.100	0.13
	(0.14)	(0.12)
FAMILY STRUCTURE IN CHILDHOOD		
Parents separated before age 16	-0.035	-0.15
	(0.12)	(0.12)
Lived with both parents at 14	0.10	0.075
	(0.12)	(0.11)
SOCIO-ECONOMIC BACKGROUND OF PARENTS		
Mother's schooling (ref. none or primary)		
- some secondary	-0.15	-0.014
	(0.15)	(0.12)
- complete secondary	-0.11	0.15
	(0.16)	(0.14)
Mother's post school qualification (ref. university)		
- TAFE	-0.16	0.21
	(0.14)	(0.13)
- other	-0.072	0.18
	(0.14)	(0.14)
- no post school qualification	-0.11	0.053
	(0.11)	(0.11)
Father's schooling (ref. none or primary)		
- some secondary	0.19	0.33***
	(0.13)	(0.10)
- complete secondary	0.27	0.17
	(0.15)	(0.12)
Father's post school qualification (ref. university)		
- TAFE	-0.12	-0.045
	(0.13)	(0.12)
- other	-0.041	-0.073
	(0.14)	(0.13)
- no post school qualification	-0.13	-0.12
	(0.12)	(0.11)
Father unemployed for at least 6 months during respondent's childhood	0.13	-0.020
	(0.10)	(0.09)
Father's occupation during childhood (ref. managerial and professional)		
- intermediate occupation	-0.046	-0.099
	(0.08)	(0.07)
- routine and manual occupation	-0.16	-0.0066
	(0.09)	(0.09)
RESPONDENT'S FAMILY FORMATION HISTORY		
Duration of current union	0.039*	0.026
	(0.02)	(0.02)
Duration of current union squared	-0.0011	-0.00073
	(0.00)	(0.00)
Having ever experienced separation	0.013	-0.0052

	(0.10)	(0.09)
No. of own children (ref. 0)		
one	-0.034	-0.30*
	(0.12)	(0.12)
two	0.031	-0.063
	(0.11)	(0.11)
three or more	-0.032	-0.098
	(0.11)	(0.11)
n	934	1036

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

Table A4. Regression of self-rated health by sex, Norway

	Men	Women
Married (ref. cohabiting)	0.037	-0.11
	(0.10)	(0.10)
Age	0.0025	0.015
	(0.01)	(0.01)
REGION AND ETHNICITY		
Region of residence until age 15 (ref. Oslo area)		
East area	-0.12	-0.25*
	(0.11)	(0.10)
South and West	-0.11	-0.084
	(0.10)	(0.10)
Mid- and North	0.042	-0.24*
	(0.11)	(0.11)
Any of the parents born outside Norway	-0.17	-0.17
	(0.13)	(0.12)
FAMILY STRUCTURE IN CHILDHOOD		
Lived with both parents at age 15	0.16	0.10
	(0.16)	(0.14)
Mother's age at respondent's birth*	-0.0041	-0.0015
	(0.01)	(0.01)
Number of siblings	0.048	-0.022
	(0.04)	(0.04)
SOCIO-ECONOMIC BACKGROUND OF PARENTS		
Mother's education*	0.0055	0.13*
	(0.09)	(0.07)
Father's education*	0.19*	0.090
	(0.10)	(0.07)
Mother worked when respondent was 15	0.099	0.054
	(0.08)	(0.08)
Father's occupation when respondent was 15*	0.22*	0.034
	(0.09)	(0.07)
RESPONDENT'S FAMILY FORMATION HISTORY		
Duration of current union	0.0016	0.0015

	(0.00)	(0.00)
Duration of current union squared	-0.000005	-0.000007
	(0.00)	(0.00)
Having ever experienced separation	-0.068	-0.26**
	(0.09)	(0.09)
No. of own children (ref. 0)		
one	0.12	0.058
	(0.17)	(0.16)
two	0.15	0.17
	(0.15)	(0.15)
three or more	0.30*	0.28
	(0.15)	(0.15)
n	921	1122

*** - variables intended to be categorical; entered as continuous in the current version but will be corrected in the future.**

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

Table A5. Regression of self-rated health by sex, Germany

	Men	Women
Married (ref. cohabiting)	0.10	0.08
	(-0.08)	(-0.07)
Age	-0.02**	-0.01
	(0.01)	(-0.01)
Region and ethnicity		
Respondent born in (ref. West Germany)		
East Germany (stayed in East)	-0.06	-0.08
	(-0.07)	(-0.07)
East Germany (moved to West)	-0.02	-0.08
	(-0.12)	(-0.11)
Outside of Germany	0.09	-0.07
	(-0.10)	(-0.11)
At least one parent born outside of Germany	0.16	0.05
	(0.17)	(-0.16)
Family structure in childhood		
Lived with both parents during first 15 years of childhood	0.17*	0.04

	(0.07)	(-0.07)
Mother's age at respondents birth (ref. 20-24 years)		
-less than 20 years	-0.13	-0.12
	(0.08)	(-0.08)
-25-29 years	-0.08	-0.01
	(0.06)	(-0.05)
-30 and above	-0.07	-0.03
	(0.06)	(-0.06)
Number of siblings	-0.01	-0.03
	(0.03)	(-0.03)
Socio-economic background of parents		
Mother's education (ref. low)		
medium	0.10	0.12*
	(0.06)	(-0.06)
high	0.14	0.26**
	(0.09)	(-0.09)
Father's education (ref. low)		
medium	0.04	0.07
	(0.08)	(-0.08)
high	0.04	0.12
	(0.11)	(-0.10)
Father's occupation during childhood (ref. working class)		
- intermediate occupation	0.00018	0.06
	(0.08)	(-0.07)
- salariat	-0.0020	0.09
	(0.09)	(-0.09)
- not working	-0.19	-0.12

	(0.17)	(-0.17)
Mother worked when respondent was 15	0.03	-0.12
	(0.08)	(-0.06)
Respondent's family formation history		
Duration of current union	0.00025	-0.0011
	(0.00)	(0.00)
Duration of current union squared	-0.0000029	0.0000021
	(0.00)	(0.00)
Having ever experienced separation	-0.0078	-0.09
	(0.05)	(-0.05)
No. of own children (ref. 0)		
one	0.11	0.03
	(0.06)	(-0.05)
two	0.10	0.13*
	(0.06)	(-0.06)
three or more	0.03	0.02
	(0.08)	(-0.09)
n	1741	1873

*** - variables intended to be categorical; entered as continuous in the current version but will be corrected in the future.**

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