



Re-evaluating the link
between marriage and
mental well-being: How
do early life conditions
attenuate differences
between cohabitation and
marriage?

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ABSTRACT

The decline in marriage and increase in cohabitation raises questions about whether marriage still provides benefits to well-being. Here we use the British Cohort Study 1970 (N=7203), a prospective survey following respondents to age 42, to examine whether partnerships in general, and marriage in particular, provide benefits to mental well-being in mid-life. We use propensity score matching to investigate whether childhood characteristics are a sufficient source of selection to eliminate differences in well-being between different partnership types. We find that matching on childhood characteristics does not eliminate advantages to living with a partner. However, the type of partnership does not matter; among those less likely to marry, marriage provides no benefits to well-being beyond cohabitation. The sources of childhood selection seem to differ by gender: matching on educational plans and scores tends to eliminate differences for women, while adolescent mental well-being eliminates many differences between cohabitation and marriage for men.

KEYWORDS

Marriage; well-being; partnership; mental health; cohabitation.

EDITORIAL NOTE

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MENTAL WELL-BEING: HOW DO EARLY LIFE CONDITIONS
ATTENUATE DIFFERENCES BETWEEN COHABITATION AND
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1. INTRODUCTION

Numerous studies have found that marriage benefits health and well-being (see Waite and Gallagher 2002, Wood et al 2007 for reviews). The strength and persistence of these findings have led some policy-makers to call for programs that encourage marriage. For example, pro-marriage policy initiatives were pushed during the George W. Bush administration in the U.S. (Bir et al 2012), and the current conservative UK government led by David Cameron has recently legislated tax breaks for married couples and plans to extend them further in the next few years (BBC 2015). Much of the research underlying these initiatives, however, has compared the married and unmarried, without distinguishing between those who were in cohabiting partnerships or single (e.g. Waite and Gallagher 2002, Hughes and Waite 2009, Liu and Umberson 2008). In addition, the majority of previous research was conducted in the U.S. during a period when cohabitation was relatively rare or practiced by a select few; less is known about marriage and mental well-being in other contexts. Given the recent increase in cohabitation and its changing meaning as it becomes more widespread (Cherlin 2004, Perelli-Harris et al 2014, Berrington et al 2015), it is important to revisit whether partnerships in general, and marriage in particular, continue to provide distinct benefits to well-being, especially for those who are less likely to marry.

Here we examine to what extent being in a partnership and the type of the partnership – marriage or cohabitation - increases well-being. We analyze recent data from the United Kingdom, which has experienced a rapid increase in cohabitation over the past few decades (Beaujouan and Ni Bhrolchain 2011). In the UK, cohabitation has become the normative pathway to union formation: in 2004-07 80% of all marriages started with premarital cohabitation. The duration of cohabiting unions has also been steadily increasing (Beaujouan and Ni Bhrolchain 2011). In addition, cohabitation has become common for childbearing: in 2012 30% of all births were born to cohabiting mothers (ONS 2013). The increase and pervasiveness of cohabitation suggests that cohabitation may be taking on much of the form and function of marriage. Because two people live together in an intimate relationship, cohabitation may provide many of the same benefits to well-being that marriage does, including sexual intimacy, emotional and social support, and social control (Umberson et al 2010, Musick and Bumpass 2012). Thus, the act of marriage per se

may not matter for well-being; instead, simply forming a stable partnership may be what is important.

Nonetheless, a large number of studies have shown distinct differences between cohabitation and marriage on a range of factors. In numerous countries, cohabitation has higher dissolution rates than marriage (Heuveline, Timberlake, and Furstenburg 2003, Galezewska et al 2013), and cohabitators without plans to marry have lower commitment levels than those who do not (Wiik et al 2009). In most countries, cohabitators tend to have lower relationship quality (Wiik et al 2012) and worse subjective well-being than married couples (Soons and Kalmijn 2009). In the UK, marriage continues to provide legal protection and social signalling (Berrington et al 2015, Perelli-Harris and Sanchez Gassen 2012). Thus, the actual act of marrying may matter more to well-being than simply living with someone.

Several studies have investigated whether the transition into marriage and/or cohabitation influences mental well-being, and whether the positive effects of these transitions are persistent across the lifecourse (Lamb et al 2003, Zimmerman and Easterlin 2006, Soons et al 2009, Musick and Bumpass 2012). Some of these studies have examined whether union formation temporarily boosts subjective well-being which then returns to baseline over time (Zimmerman and Easterlin 2006, Soons et al 2009). These studies tend to employ a panel design that starts in young adulthood, providing insights into transitions during a short period but not directly comparing long-term cohabiting and marital unions and their effects in mid-life. For example, using fixed-effects models, Musick and Bumpass (2012) find that transitions into cohabitation and marriage have similar effects on psychological, health, and social well-being, and any differences found are relatively small; however the study does not examine the consequences of cohabitation versus marriage later in the lifecourse. In addition, while this and other studies using fixed-effects models examine variation within individuals over time, they do not compare across individuals with different characteristics that select people into cohabitation or marriage. Hence, these studies do not examine whether marriage is likely to increase well-being for those who are less likely to marry, usually those targeted by pro-marriage policies.

Our study uses propensity score matching to investigate differences between marriage and cohabitation. We identify marriage as a “treatment” and examine whether people with similar background characteristics are more likely to have higher mental well-being scores if they marry. This approach takes into account important selection characteristics that predict both union formation and well-being. By matching people with similar characteristics, we can ascertain whether marriage is good for well-being at mid-life compared to cohabitation, especially for those who are not likely to marry. Our data, the British Cohort Study 1970 which has followed individuals since birth up to age 42, is ideally suited to investigating this question. This cohort experienced partnership formation in the 1990s and 2000s, which is more recent than many previous studies (e.g. Musick and Bumpass 2012). By age 42, the majority of childbearing has already occurred and most who postponed marriage throughout young adulthood would have already married. Given that we are not interested in the timing of marriage/cohabitation per se, the propensity score matching approach is appropriate for examining whether currently being in a marriage matters. However, since the duration of and investments in a union may signal the positive benefits of the partnership, we also compare the type of union for those who have been in long-lasting partnerships, never experienced union separation, and have had children together. In addition, we compare results for men and women, who may experience the effects of partnership transitions on well-being differently.

Our research design also allows us to examine the role of different types of early life conditions on later life outcomes, contributing to the growing body of research investigating these links (Umberson et al 2010, Elo 2009, Kuh et al 2004). With our model, we can see to what extent factors measured in childhood and early adolescence are sufficient for eliminating selection effects into cohabitation or marriage that would produce differences in well-being. In other words, by matching people based on different types of background characteristics, we can ascertain which source of selection eliminates the effects of marriage on well-being. We focus on three types of background measures: 1) family structure and socio-economic status, such as father’s occupation and parental divorce; 2) cognitive abilities and educational aspirations; and 3) psychological attributes measured in adolescence including locus of control, malaise, and behavioural control. With this approach we can see, for example, whether matching people based on childhood family structure is sufficient

for reducing differences between cohabitation and marriage at age 42. Hence, this study not only provides insights into whether marriage makes a difference to well-being above and beyond simply living in a partnership, it also contributes to our understanding of the role of early life conditions in understanding these differences.

2. BACKGROUND

While numerous studies have established a positive link between marriage and well-being, few have compared cohabitation and marriage. Note, however, that cohabitation and marriage are usually not either-or statuses; couples who are currently married in mid-life may have previously cohabited, and those who are currently cohabiting may have plans to marry. In our study, 75% of current unions that started as cohabiting relationships converted to marriage. This fluidity of partnership status indicates that it is usually incorrect to simply label people as “cohabitators” or “married people.” In this study, we consider marriage a “treatment,” in that couples must officially decide to marry and act on that decision, but we recognize the fluidity of relationships and that cohabiting couples may marry later in life (Musick and Bumpass 2012, Perelli-Harris et al 2014).

Below we focus on several conceptualizations of partnership that may result in benefits to well-being. First, we examine whether simply living with a partner at age 42, regardless of being married or cohabiting, provides a boost to well-being. Then we consider current partnership type (at age 42); marriage may provide an additional benefit to well-being above and beyond simply living with a partner. However, examining current status is insufficient; marriages are often of longer duration, and cohabiting unions are more likely to dissolve (Galezewska et al 2013). The length of a union may be related to the partners’ commitment, and the experience of union dissolution can have long-lasting effects on well-being (Hughes and Waite 2009). Thus, we compare union status for individuals in increasingly committed relationships: those in partnerships lasting longer than three years, and first relationships which never dissolved. Finally, we examine whether the partners have children, as they may signal an important investment in the relationship.

2.1. CURRENT RELATIONSHIP STATUS

An individuals' current partnership status, regardless of whether married or cohabiting, is potentially the most relevant to current well-being. Living in a partnership usually provides sexual and emotional intimacy, companionship, and daily interaction, which can promote well-being. An intimate partner can provide care, social and emotional support and encourage healthy behaviors (Umberson et al 2010). In addition, partners often link each other to greater friendship and kin networks that can provide social support (Ross 1995). Living together and sharing a household can lead to economies of scale. The savings incurred may be particularly important for low-income couples, who in qualitative interviews in the UK have mentioned that the decision to move in together was motivated by housing costs (Berrington et al 2015).

Beyond simply living with a partner, however, living in a marital union may provide unique benefits to well-being (Waite and Gallagher 2002). Marriage is often a social sign of commitment, also known as “enforceable trust” (Cherlin 2000). The symbolic promise of marriage may provide couples with a long-term perspective that the future of their relationship is secure. Because marriages are legally harder to dissolve, couples may be more motivated to work through their disagreements, thereby maintaining union stability and with it general life stability. The long-term perspective may also benefit personal and social control, meaning spouses deliberately influence each other's personal behavior, because they want them to be healthy and live longer (Umberson 1987). The reduction in life uncertainty and increased care could enhance well-being (Soons et al 2009, Liu and Umberson 2008), and even result in psychological or cognitive changes that promote mental well-being (Li et al 2015). These benefits may be enhanced further through personal networks, such as in-laws, which provide extra support to married couples, because the relationships are more defined (Umberson et al 2010). In addition, the UK legal system continues to favor marriage in terms of inheritance tax and access to the courts when unions dissolve (Perelli-Harris and Sanchez Gassen 2012). Although general social disapproval of cohabitation is low in Britain, the social expectation to marry is still pervasive (Berrington et al 2015). Thus, although living with someone may result in many of the same benefits to mental well-being, in today's Britain, marriage may

still be a sign of a more committed relationship and confer additional social and legal benefits, which would in turn enhance well-being.

2.2. LONG-LASTING PARTNERSHIPS AND FIRST PARTNERSHIPS

Although current partnership status conveys certain immediate benefits, longer union duration is usually a sign of a stable, committed relationship potentially providing a greater boost to well-being. Poor quality relationships are more likely to end, and relationships with negative effects on well-being are weeded out. Over time, commitment increases, and couples are likely to invest more in the relationship, for example by investing in housing or pooling resources (Lyngstad et al 2010, Heimdal and Houseknecht 2003). Long-term cohabiting relationships tend to reflect deeper commitment, and given the lack of social sanctions against cohabitation in the UK, may be no different to marriage with respect to well-being.

On the other hand, as people adapt to marriage and cohabitation, they often return to their initial levels of well-being (Soons et al 2009, Zimmerman and Easterlin 2006, Lucas and Clark 2006). Relationship quality tends to decline over time, as partners become used to each other, and the “honeymoon effect” wears off. One Dutch study observed that entrance into cohabitation and marriage increased subjective well-being, with marriage providing the highest boost to well-being, but moderate adaptation occurred in the long run (Soons et al 2009). Soons et al (2009) argue, however, that the return to previous levels occurs very slowly, especially compared to the never partnered whose well-being declines more rapidly. Thus, union duration appears to work in contradictory ways: unions of longer duration imply greater commitment and investment in the relationship, but at the same time, subjective well-being tends to decline after the “honeymoon period.” The question then is whether unions that have made it through this period are similar in their effects on well-being, regardless of whether they are cohabiting or marital. By comparing people who have made it through the “honeymoon period,” we can see to what extent marriage provides additional benefits in mid-life, after the effects of early partnership formation have worn off.

Partnership dissolution may also negatively influence mental well-being (Carr and Springer 2010, Amato 2010). Previous research has found that divorce inflicts costs on physical and mental health for many years, even for those who remarry (Hughes and Waite 2009). People who cohabit may be more at risk for the negative effects of union dissolution, because cohabiting unions are often of shorter duration and have higher dissolution rates than marriage (Beaujouan and Ni Bhrolchain 2011). As a consequence, a greater proportion of those currently cohabiting in mid-life may be repartnered than the proportion currently married. In addition, people who have separated or divorced are more likely to choose cohabitation for subsequent relationships (Galezewska et al 2013), and second or higher-order partnerships often have higher dissolution rates and worse relationship quality (Sweeney 2010, Hughes and Waite 2009). Thus, because cohabitators are more likely to have experienced union dissolution, it is important to compare cohabitators and married people who are living with their first partner to eliminate any lingering effects of partnership instability.

2.3. UNIONS WITH CHILDREN

Having shared children can be an important sign of investment in a relationship. Previous studies have considered childbearing to be an indicator of the similarity between cohabitation and marriage (Raley 2001, Heuveline and Timberlake 2004). Like married parents, cohabiting parents have a shared interest in their children, can provide care and other resources, and may work harder to maintain their relationship to ensure stability. Unmarried fathers in the UK have the same rights as married fathers and face little social disapproval for not marrying their child's mother (Perelli-Harris and Sanchez Gassen 2012, Barlow and James 2004, Park and Rhead 2013). Nonetheless, studies show that cohabiting parents continue to be different from married parents; for example, in the UK cohabiting parents are more likely to separate (Goodman and Greaves 2010) and have lower second birth rates than their married counterparts (Perelli-Harris 2014). Hence, cohabiting parents with shared children may continue to have different well-being than married parents.

2.4. SELECTION CHARACTERISTICS FROM CHILDHOOD

The benefits of partnerships and marriage may not be causal, but instead the result of social selection, which suggests that differences in well-being are due to the characteristics of the people who choose to be in a particular type of partnership. In our study, we focus on childhood characteristics that occur before the “treatment,” or entering into an adult partnership. Parental influences and characteristics that have developed in childhood are very important for determining later life outcomes (see Elo 2009, Kuh et al 2004 for reviews). Health and mortality research suggests that the “long arm of childhood” extends into adulthood and is a significant predictor of adult health outcomes (Hayward and Gorman 2004, Palloni 2006). In this paper, we consider three types of interrelated background characteristics: parents’ socioeconomic status and family structure; child’s cognitive development and educational aspirations; and psychological attributes.

Parental socio-economic status is one of the most significant predictors of future life outcomes (Case et al 2005, Luo and Waite 2005). The intergenerational transmission of conditions and behaviors is extremely important for educational trajectories, social mobility, and future employment (Goodman et al 2011), all of which can have implications for both partnerships and mental well-being. Parents’ socioeconomic position influences childhood development and adult outcomes through a complex set of transmission mechanisms, including values and attitudes, resources, behaviors, social interactions (Goodman et al 2011), and genetic endowments (Li, Liu and Guo 2015). Some of the characteristics of the parents seem to directly influence cohabitation and marriage, for example in Britain the mother’s age at birth and father’s social class have been associated with entrance into cohabitation (Berrington and Diamond 2000). Parents’ marital status and divorce in childhood can also hinder the development of interpersonal and relationship skills, cognitive growth, and educational achievement (Amato 2010, Kim 2011), which again may influence both partnership formation and mental health. Parental divorce often leads children to reject the institution of marriage and adopt more favorable attitudes towards cohabitation and divorce (Axinn and Thornton 1996), as well as choose cohabitation for their own relationships (Perelli-Harris et al 2015).

Despite the strong influence of the parental home, however, children usually develop their own independent personalities, dispositions, and abilities throughout childhood and adolescence. Many different factors can influence this independent development; for example, during adolescence, peers can be more important for personal development and individual behavioral choices than parents (Umberson et al 2010). The children's cognitive development and educational aspirations in childhood usually influence future educational attainment, which can in turn influence mental well-being and partnership formation. In many countries, marriage is associated with higher education (Kalmijn 2013), which may also influence well-being, suggesting that childhood cognitive abilities and educational aspirations may be key predictors for both partnership formation and mental well-being.

Finally, an individual's psychological and behavioral attributes in childhood can have major influences on both partnership formation and mental well-being. Psychological attributes, for example depression, self-esteem, locus of control, and behavioral problems, are usually predictors of future mental health (Goodman et al 2011), or even an alternative way of measuring the baseline of mental health. Previous studies demonstrate that childhood psychological problems have a long-term effect on adult family income and other non-economic outcomes (Goodman et al 2011). Psychological attributes in childhood may be influenced by genetic predispositions that lead to mental health problems such as depression. An individual's capacity to mobilize available resources, develop coping mechanisms, and become resilient to adversity can shape behavior and psychological outlook (Kuh et al 2004). Hence, examining the contribution of childhood mental health on future mental health helps us to better understand the relationship between partnership formation and mental well-being.

3. DATA AND METHODS

To examine the effect of different partnership experiences on well-being in mid-life, we employ the British Cohort Study 1970 (BCS70), which is a nationally representative prospective survey of men and women born in Britain in one week of April 1970¹ We use data from sweeps 1970, 1980, 1986, 2012 and merged partnership histories (Centre for Longitudinal Studies 2012). The cohort members were followed

throughout their lives until age 42 (see Figure 1). Before the children reached adulthood, information about cohort members was provided by parents, teachers, nurses, and through self-completed questionnaires. We restrict our sample to the men and women who participated in the survey at age 42 in 2012. Although attrition occurred throughout the period of data collection, follow-up for this wave was relatively high, with a survey response rate of 75% (TNS BMRB 2013). We omit cases with missing partnership histories and missing a well-being score. We do not analyze the participants who were added into the survey after birth but before age 16, because we rely on several indicators measured at birth. We also dropped respondents living in same sex relationships, because until recently they were unable to legally marry in the UK. As a result, our analytical sample is 7203 men and women.

Figure 1 shows the waves of data collection in the BCS70 that are relevant to our methodological approach. The figure shows the years and age at which background characteristics, partnership trajectories, and the outcome variable were measured. The information on background characteristics was collected before partnership histories started to be recorded, ensuring the correct causal ordering between background factors and the propensity to be in different relationship types. Partnership histories were collected starting in the 2000 wave and covered the period from when the cohort member was 16 to age 42. The Centre for Longitudinal Data provided a data file merging cleaned histories available up to 2008 (Hancock 2011), and we updated partnership histories with wave 2012, which included partnership records for participants not interviewed in 2008.

One of the limitations of this study is the high proportion of missing responses on some of the questions collected at age 16. Although the overall response rate for those who had been traced was around 88%, a teacher strike in 1986 meant about half the students did not complete the in-school questionnaires, which included the psychological attribute questions. Because the teacher strike was not restricted to particular locations in the UK, and the proportion of students attending each school sector was broadly representative (Gerova 2006), the missingness seems to have occurred at random. To preserve the sample size and reduce bias in the estimation effects due to the missing values, we employed Multiple Imputation using chained

equations for missing observations on variables measured up to the age 16. The imputation was performed separately for men and women using STATA 13.

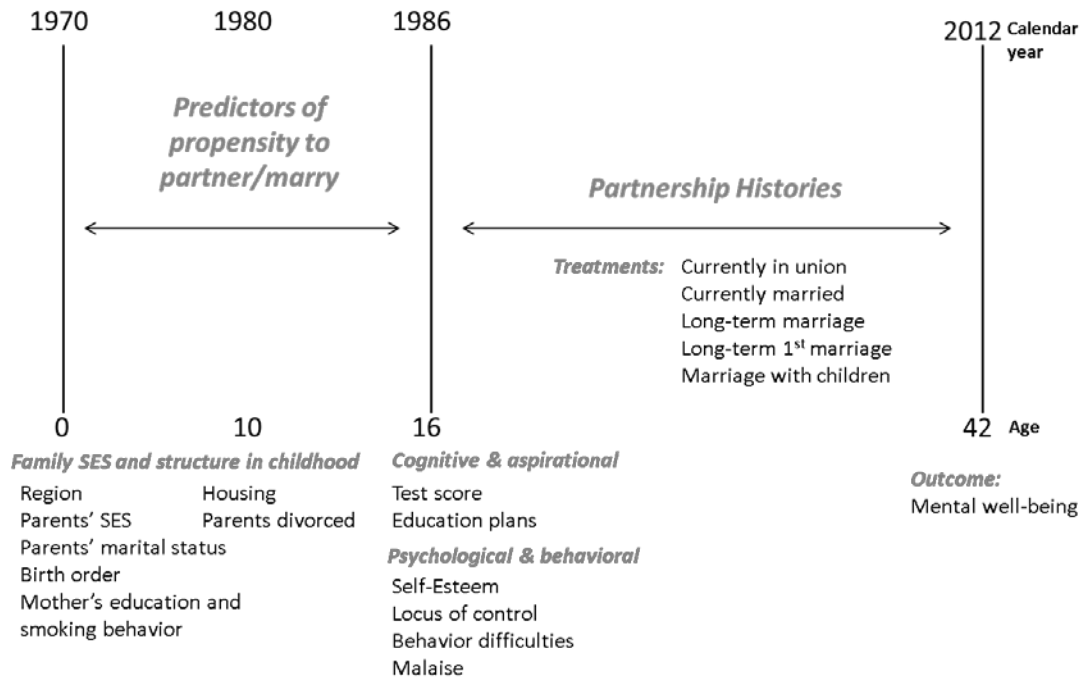


Figure 1: Methodological scheme based on the British Cohort Survey 1970

3.1. ESTIMATING UNION FORMATION TREATMENT EFFECTS.

As mentioned above, we use Propensity Score matching to compare people with similar childhood background characteristics. Other studies of the BCS70 examine the association between partnership histories and outcomes using linear regression and simply control for background characteristics (e.g. Ploubidis et al 2014). Ordinary Least Squares (OLS) regression, however, does not examine whether people who are selected into cohabitation or marriage would benefit from being married. Propensity Score matching allows us to better isolate the effects of marriage on people with similar backgrounds. For example, we can examine whether people with a low propensity to cohabit would receive a benefit from marriage. Nonetheless, PSM only matches people on observed characteristics and does not match people on unobservables, such as parents' marital quality in childhood, developments that occur after childhood, or current partnership quality, and therefore it is unlikely to demonstrate a true causal effect.

Below, we first present unmatched mean differences in well-being by relationship type and indicate whether the differences are significant. We then estimate propensity scores to minimize the potential bias of nonrandom selection into different types of unions (the treatment). Propensity scores are conditional probabilities of experiencing the partnership treatment using logit regression (Guo and Fraser 2014). In order to estimate the propensity score, we draw on factors and characteristics measured at birth in 1970, at age 10 in 1980, and age 16 in 1986. The next step uses propensity score matching (PSM) to match respondents in each sample based on the predicted probability to experience a given partnership status (the treatment). PSM models estimate the average effect of treatment among people who are similar by comparing well-being scores (the outcome) among matched treated and untreated individuals. The complete procedure of estimating propensity scores, matching on them, and estimating the average treatment effects was repeated with each of the datasets created by the multiple imputation procedure. In order to obtain a single estimate of treatment effects reported here we used multiple imputation combining rules (Rubin 2004). Below we show results which use kernel matching and are balanced. We have also investigated using nearest neighbor matching, which resulted in very similar estimates.

Outcome variable: The Warwick-Edinburgh Mental Well-Being Scale (WEMWBS) is a battery of 14 questions focusing entirely on aspects of positive mental health, such as whether respondent felt optimistic, loved, relaxed, confident, good about themselves, etc. (Tennant et al 2007). Respondents were asked the WEMWBS questions in self-completion questionnaires sent to eligible cohort members before the main Computer Assisted Personal Interview. The score was only calculated if all 14 items were completed and is available for 82 percent of respondents participating in the 2012 sweep. Eleven percent had not returned the paper questionnaire and seven percent had a missing response on at least one WEMWBS item. Analysis with logistic regression indicated that men, respondents with children, the unmarried, lower educated and disabled were less likely to have the well-being score. The WEMWBS captures two dimensions of mental health: subjective well-being or happiness, and psychological functioning and self-realization (Tennant et al 2007). Previous analysis has shown that the scale has good content validity and reliability in the UK, making it a useful measure of mental health (Tennant et al 2007). In our sample it has a

Cronbach's alpha of 0.92 indicating that it has high internal consistency. Table 1 shows that the mean WEMWB score is around 49.

Variable	Description or modalities	Mean or percent	Standard deviation	Range	Cronbach's Alpha
Dependent variable					
Mental well-being	Warwick Edinburgh Mental Well-being scale measuring the positive aspects of mental health, derived using 14 questions (details available upon request)	49.1	8.4	14-70	0.92
Analyses stratified by					
Sex	Male	47.0			
	Female	53.0			
Variables included in the Propensity Score Matching					
Parental family characteristics					
Region of birth	Scotland, Northern Ireland and North	36.7			
	Midlands and Wales	22.7			
	South West	7.1			
	South East and East	33.5			
Social class at birth	V+IV unskilled and partly-skilled	19.9			
	III manual	43.7			
	III non manual	15.2			
	I + II managerial, technical, professional	21.2			
Parent's marital status and timing of birth	not married	5.4			
	married prior to conception	86.8			
	married after conception	7.8			
Age mother finished education	14 years old or younger	6.0			
	15 or 16 years old	74.0			
	17 years old or older	20.0			
Age of mother at first birth	<20	22.5			
	20-24	51.2			
	25 and over	26.3			
Smoking behavior of mother	non smoker	44.0			

during pregnancy	stopped smoking before or during pregnancy	17.9			
	smoked during pregnancy	38.1			
Respondent's birth order	first child	35.8			
	second or next child	64.2			
Parent's place of birth	both parents born in the UK	90.0			
	at least one parent born outside the UK	10.0			
Living with both biological parents at age of 10	No	14.7			
	Yes	85.3			
Housing tenure (age 10)	owner occupier	67.4			
	public rented	26.4			
	other	6.2			
Cognitive and aspirational characteristics at age 16					
Respondent's plan to continue education training after the age of 18	No	53.4			
	Yes	33.7			
	don't know	12.9			
Vocabulary Test score	Standardized Vocabulary Test score	0.1	1.0	-3.4-2.3	
Psychological and behavioral characteristics at age 16					
Rutter behavior score	Index of behavior difficulties, derived using 19-item Rutter Behavior Scale questions	4.1	3.8	0-38	0.77
LAWSEQ	Scale of self-esteem with reference to teachers, peers and parents and consisted of 10 items	15.2	3.4	0-20	0.67
CARALOC	Locus of control scale, measures children's perceived achievement control, consisting of 19 items	9.9	3.0	0-15	0.60
Malaise score	Scale to measure signs of psychological distress or depression, based on Malaise Inventory	9.0	5.3	0-44	0.82

Table 1: Descriptive statistics of variables included in the analytical models

Source: Authors own calculations with BCS70 data.

Treatments: We examine the effect of two treatments: 1) currently being in a partnership and 2) being married (Table 2). We start by including everyone in the survey and examining whether being in a partnership matters for well-being (sample 1). We then examine increasingly selective, or committed, types of unions and compare marriage with cohabitation (samples 2-7)¹. In the end, we finally compare people who are in relationships more similar to traditional marriage: first long-term unions with children. The specific samples are:

1) *Currently in a co-residential partnership.* The first treatment is currently being in a partnership, regardless of union type or duration. This model demonstrates whether currently being in a relationship benefits mental well-being for the entire survey sample. Those who are currently not in a partnership may have never been in a partnership or may have previously been in a partnership and are now divorced or separated.

2) *Currently married, among those currently in a partnership.* Sample 2 is restricted to those who are currently in a partnership and examines whether currently being married boosts well-being more than currently cohabiting. Duration of union and prior union dissolution are not taken into account, which could have a differential impact on well-being, if married people are more likely to be in long-term committed unions.

3) *Currently married, among those in a partnership lasting longer than three years.* This model examines differences between marriage and cohabitation for those who have been in a long-lasting partnership. It restricts the analysis to those who have not recently experienced union dissolution, which can have short-term negative effects on well-being (Demey et al 2013). It also minimizes the “honeymoon effect” of relationship formation; previous studies have found that forming a relationship in the last 2-3 years provides a boost to well-being, but the initial gains subsequently diminish (Musick and Bumpass 2012, Zimmerman and Easterlin 2006). Note that this specification still does

¹ We have investigated alternative ways to include duration in the treatment, but were unable to do so, because duration of the union occurs after selection into partnership, and because of the complexity of union formation, i.e. cohabitating unions can transition to marriage. For example, stratified propensity score matching stratifies the sample on background characteristics measured before the treatment. Categorical or continuous treatments cannot distinguish between categories that are not the reference category. Therefore, our solution is to present increasingly select groups to compare people with more similar unions.

not completely eliminate differences in the duration of cohabiting and marital unions, and on average, marital unions are longer than cohabiting unions.

4) *Currently married, among those in a first relationship lasting longer than three years.* This sample provides the most direct comparison of cohabitation to traditional marriage, because it only includes men and women in long-lasting relationships who have never experienced partnership dissolution. Note that we do not know whether the respondent's partner is also in a first relationship.

5) We also examine treatments 2, 3, and 4 for couples who have had children together, i.e. we excluded childless couples, couples with stepchildren, foster children and adopted children.

Category	Frequency	Percentage	Mean well-being	SD of well-being	95% CI
Men					
Currently not in partnership	764	22.6	46.0	9.2	45.4-46.7
Currently in partnership	2620	77.4	49.9	7.7	49.6-50.2
Currently cohabiting	547	20.9	48.9	8.0	48.3-49.6
Currently married	2073	79.1	50.2	7.5	49.8-50.5
Long lasting cohabitation	406	16.8	48.5	8.1	47.7-49.3
Long lasting marriage	2011	83.2	50.1	7.5	49.8-50.4
First and long lasting cohabitation	255	14.6	48.4	7.9	47.4-49.3
First and long lasting marriage	1491	85.4	50.1	7.4	49.7-50.4
Currently cohabiting with child(ren)	269	13.6	48.8	8.1	47.8-49.7
Currently married with child(ren)	1708	86.4	50.0	7.4	49.7-50.4
Long lasting cohabitation with child(ren)	244	12.6	48.6	7.9	47.6-49.6
Long lasting marriage with child(ren)	1685	87.4	50.0	7.4	49.7-50.4
First and long lasting cohabitation with child(ren)	173	11.8	48.4	7.5	47.3-49.5
First and long lasting marriage with child(ren)	1292	88.2	50.1	7.3	49.7-50.5
Women					
Currently not in partnership	914	23.9	46.8	9.0	46.2-47.4
Currently in partnership	2905	76.1	50.0	8.2	49.7-50.3
Currently cohabiting	590	20.3	48.6	8.4	48-49.3
Currently married	2315	79.7	50.3	8.1	50-50.6
Long lasting cohabitation	432	16.1	48.4	8.4	47.6-49.1
Long lasting marriage	2252	83.9	50.3	8.1	50-50.6
First and long lasting cohabitation	261	13.9	48.2	8.0	47.2-49.1
First and long lasting marriage	1613	86.1	50.4	8.2	50-50.8
Currently cohabiting with child(ren)	261	11.9	48.4	8.4	47.3-49.4
Currently married with child(ren)	1926	88.1	50.3	8.2	49.9-50.7
Long lasting cohabitation with child(ren)	238	11.2	48.5	8.4	47.4-49.5
Long lasting marriage with child(ren)	1896	88.8	50.3	8.2	49.9-50.6
First and long lasting cohabitation with child(ren)	166	10.4	48.5	8.5	47.2-49.8
First and long lasting marriage with child(ren)	1437	89.6	50.3	8.2	49.9-50.7

Table 2: Mean mental well-being scores by partnership status

Background variables: We employed a number of strategies to select the covariates used to create the propensity score. First, we chose variables from previous studies that predicted entrance into cohabitation and marriage (e.g. Berrington and Diamond 2000). Second, we included variables to better control for the selection into forming a union and marrying, paying attention to whether the PSM balances. Finally, based on theoretical considerations, we settled on a model that includes variables from each of the three primary domains of influence in childhood: parental socioeconomic position

and family structure; cognitive abilities and educational aspirations; and psychological attributes (Table 1).

4. RESULTS

4.1. DESCRIPTIVE STATISTICS

In Table 2 we report mean values, the standard deviation, and confidence intervals of the mental well-being indicator (WEMWBS) by gender and treatment. About 23% of men and 24% of women currently live outside of a partnership; those not in a partnership have significantly lower mean well-being scores (46 for men and 47 for women) than those in a partnership (50 for men and women). Of those currently in a partnership, cohabitators have significantly lower mean well-being scores than married people, but the difference is not as great as between the un-partnered versus partnered. The raw differences between those in long-lasting cohabiting and marital relationships are also significant, but not as large, especially when people are in their first relationships. Differences are also small when they have had children together. Nonetheless, with the exception of men currently cohabiting and having a child with their partner, cohabitators always have significantly lower well-being scores than married people.

4.2. PROPENSITY SCORE MATCHING

In Table 3 we report mean differences between the WEMWBS scores for the treated and untreated groups. Each row shows the estimates for the different treatments and samples. Column 1 shows the difference when the samples are not matched on background characteristics, but it only includes those restricted to the common support by the PSM procedure. In line with the descriptives from Table 2, the unmatched differences are statistically significant. Columns 2-5 show the propensity score estimates after matching on alternative sets of childhood characteristics. This approach allows us to see whether propensity score matching eliminates significant differences between the treated and untreated groups, but also to determine whether specific types of selection characteristics are more likely to reduce significant differences. In Table 3, we only present the ATU, or the average effects of the treatment on the untreated. The ATU shows the effect of either being partnered or

married for those who have a low propensity to partner or marry. This is opposite to the ATT, which shows the effects of being partnered or married among those who have a high propensity to partner or marry. We take this approach, because we are most interested in whether marriage provides benefits to those who are unlikely to marry, although overall, the results are very similar for ATU and ATT.

	Un-matched difference	ATU, all variables	ATU, family background only	ATU, educ. scores & plans only	ATU psych. measures only
Men					
Currently in partnership, among all respondents	3.88 *** (0.33)	3.00 *** (0.39)	3.71 *** (0.37)	3.79 *** (0.37)	3.12 *** (0.40)
Currently married, among respondents in partnerships	1.22 ** (0.37)	0.60 (0.44)	0.92 * (0.39)	0.96 * (0.40)	0.82 (0.42)
Currently married, among respondents in long lasting partnerships	1.65 *** (0.41)	0.96 (0.49)	1.32 ** (0.44)	1.34 ** (0.46)	1.21 * (0.48)
Currently married, among respondents in first and long lasting partnerships	1.71 *** (0.50)	1.16 (0.60)	1.37 * (0.54)	1.37 * (0.55)	1.41 * (0.60)
Currently married, among couples with child(ren)	1.29 * (0.49)	0.65 (0.58)	0.92 (0.54)	1.00 (0.54)	0.84 (0.59)
Currently married, among long lasting couples with child(ren)	1.47 ** (0.51)	0.81 (0.61)	1.13 * (0.55)	1.18 * (0.56)	1.03 (0.59)
Currently married, among first and long lasting couples with child(ren)	1.64 ** (0.59)	1.08 (0.76)	1.27 * (0.63)	1.31 * (0.63)	1.37 (0.70)
Women					
Currently in partnership, among all respondents	3.15 *** (0.32)	2.94 *** (0.48)	2.84 *** (0.34)	3.33 *** (0.46)	2.39 *** (0.36)
Currently married, among respondents in partnerships	1.66 *** (0.38)	0.69 (0.54)	1.45 *** (0.39)	1.12 * (0.52)	1.26 ** (0.41)
Currently married, among respondents in long lasting partnerships	1.94 *** (0.43)	0.69 (0.61)	1.73 *** (0.44)	1.12 (0.60)	1.48 ** (0.47)
Currently married, among respondents in first and long lasting partnerships	2.20 *** (0.54)	0.79 (0.77)	2.05 *** (0.55)	1.08 (0.73)	1.60 ** (0.57)
Currently married, among couples with child(ren)	1.93 *** (0.54)	0.29 (0.75)	1.72 ** (0.56)	0.62 (0.73)	1.54 ** (0.58)
Currently married, among long lasting couples with child(ren)	1.81 ** (0.57)	0.22 (0.79)	1.60 ** (0.58)	0.62 (0.77)	1.43 * (0.60)
Currently married, among first and long lasting couples with child(ren)	1.78 ** (0.68)	0.41 (1.00)	1.41 * (0.71)	0.08 (0.96)	1.36 (0.73)

Table 3: Matching estimates of partnership status on mental well-being scores at age 42

Notes: Numbers in parentheses are SEs. Two-tailed tests. * P < .05; ** P < .01; *** P < .001.

Matching on all background characteristics. Column 2 shows the ATU when all relevant childhood background characteristics are included in the model. After matching on all variables, only the mean well-being scores for those currently in and out of a union remain significantly different. Overall, these results indicate that matching people with similar childhood characteristics eliminates differences between cohabitation and marriage, implying that early life conditions are an important source of selection.

Not being in a relationship, however, continues to have a substantial negative impact on well-being, even after matching on all childhood characteristics. Note not being in a partnership may reflect recent relationship break-down or a long-term decline in well-being due to never partnering (Soons et al 2009). Factors that may currently impact well-being, such as unemployment or financial strain, may further reduce and eliminate differences. In addition, propensity score models do not control for unobserved factors not included in the background characteristics. Nonetheless, our results are robust to a number of different specifications of childhood characteristics that often predict future outcomes, suggesting that currently living with someone may indeed provide a boost to well-being.

Sources of selection. We next turn to examining specific types of childhood background characteristics to better isolate which type matters for eliminating differences for each treatment sample. Table 3, column 3 shows the results of matching on a whole host of family background characteristics (see Table 1 for the full list). We can see that for women, matching on these characteristics reduces but does not eliminate significant differences in well-being between cohabiting and married people for any of the treatment groups. This is the same for men, except for currently married men with children, for whom the differences disappear. These findings suggest that for the most part parental socio-economic background and family structure are insufficient to explain the differences in adult well-being between cohabiting and married people. Thus, considering only family background, marriage might have a beneficial effect on people who have a low propensity to marry.

We next turn to column 4, which matches people according to their vocabulary test scores and educational plans at age 16. These factors are a proxy for future education and employment prospects, which have been associated with marriage in other studies (e.g. Berrington and Diamond 2000). Note that the logit regression models used to estimate the propensity scores show similar results: those with low educational aspirations are more likely to cohabit (results not shown). Table 3 shows that for men, matching on education plans does not eliminate significant differences in well-being between marriage and cohabitation in any of the treatment groups, except for those currently in unions with shared children. This implies that simply controlling for educational plans is not sufficient for eliminating differences. It may also mean that marriage may be beneficial for those who have a low propensity to marry; in this case, low educated men. Nonetheless, we know from the other PSM analyses that other sources of selection into cohabitation may be interrelated with educational plans; therefore, we urge caution in interpreting our results as marriage necessarily being positive for low educated men. The ATU estimates for women, on the other hand, indicate few differences between cohabitation and marriage after matching on educational plans and test scores. Hence, educational aspirations are a strong source of selection for women.

Finally, column 5 shows estimates for people matched on psychological attributes measured at age 16. This battery of measures, including locus of control, malaise, behavioural problems, and self-esteem, is aimed at capturing well-being prior to union formation and approximates a baseline level of well-being. We assume it is one of the strongest sources of selection: people with worse psychological well-being in childhood would be less likely to marry. For men, matching on psychological attributes in childhood eliminates differences between cohabitation and marriage for currently married men and men in any type of union with children. This implies that marriage does not make a difference to well-being for men who have children with their partner even if they have a low propensity to marry based on early psychological characteristics. For women, on the other hand, matching on psychological attributes eliminates differences between cohabitation and marriage only for women in first unions with children. Thus, marriage may distinguish those with higher well-being unless the relationship has endured for a long time and has produced children. Overall, these results suggest that while psychological characteristics in childhood are

a strong selection factor for men with shared children, they are less important for women, unless they have demonstrated their commitment by staying together and having children.

5. DISCUSSION

This study provides insights into the role of marriage and cohabitation, and relationships in general, on mental well-being in mid-life. As in previous studies, we see significant benefits to marriage when comparing raw differences in well-being scores between cohabiting and married people, even when comparing increasingly committed relationship types. However, the benefits to marriage versus cohabitation disappear completely when we compare the effects of marriage among people who have similar childhood characteristics. This is also the case for people who have a low propensity to marry: marriage would not improve their well-being. The benefits to currently being in any type of relationship, on the other hand, do not disappear when matching people on childhood characteristics; people who do not live with a partner have on average well-being scores that are lower than those who live with a partner.

Note that this study has several limitations. First, while our prospective, longitudinal dataset is ideally suited for examining the effects of partnership on future well-being while controlling for prior background characteristics, the BCS70 suffers from attrition and a large number of missing cases at age 16. Although we performed multiple imputation, this approach assumes that variables measured at birth and age 10 generally predict adolescent characteristics, which leaves little independent development throughout adolescence and may overestimate the effect of early life conditions. Second, the propensity score matching analysis only provides mean differences, which may not reflect the heterogeneity of cohabiting individuals. PSM also requires that we define a single treatment, which limits the complexity of partnership histories that we can compare. In order to get around this, we examine increasingly committed types of unions, but we still do not directly compare individuals who have experienced union dissolution or subsequent repartnering. In addition, we cannot control for unions of different duration. If subjective well-being declines over the duration of the partnership (Soons et al 2009), and marital unions are on average longer, then some of the cohabiting unions may still be experiencing

greater well-being benefits due to more recent partnership formation, and in the long-run, marriage may still confer greater benefits to well-being. Despite these limitations, however, the results provide insights into new partnership types and have the following implications.

First, we see the importance of currently being in a co-residential relationship for mental well-being in mid-life, regardless of relationship type. The raw differences in well-being scores were relatively large, and numerous selection mechanisms in childhood, many of which would have predicted future behavior and well-being, were unable to eliminate these differences. These results suggest that living with an intimate partner is likely to boost well-being, possibly by providing emotional support, social networks, sexual intimacy, companionship, and social meaning – all of which are good for mental health (Umberson et al 2010). Nonetheless, we did not control for developments in adulthood or current factors which may impact well-being, such as income or friends, and we cannot say the models completely isolated causal effects. Additional research, for example using weighted regression, could be used to control for contemporaneous effects, but because the main focus of this paper is cohabitation and marriage, we have not conducted these analyses.

Our main finding that cohabitation and marriage have similar long-term implications for well-being after matching is particularly interesting given the rapid increase in cohabitation in Britain. For the 1970 cohort 81% of current marriages started with cohabitation. Hence, cohabitation is becoming an acceptable and common partnership form, especially as a way to enter a union. Nonetheless, by age 42, relatively few are still in first unions which have lasted for at least three years, have not married, and have had children (only about 5% of all people, and 12% of those still in a first long-lasting union). This small percentage suggests that staying in a long-term cohabiting union into mid-life is still a marginal behavior in Britain. Also note that the positive association between marriage and well-being only disappears when matching on early childhood characteristics, implying that while marriage may not have a causal effect on well-being, the people who choose to enter cohabitation are still different on average from those who marry.

Although the analyses provide evidence that a range of background characteristics eliminates the differences between cohabitation and marriage for both men and women, we also found variation according to specific sources of selection. Surprisingly, the large range of parental background characteristics was unable to remove differences between cohabitation and marriage, except for men currently in a partnership with shared children. These results suggest that marriage would still be beneficial, if the only source of selection were socio-economic status. Childhood test scores and educational plans, on the other hand, resulted in an interesting gender distinction. For women, matching on educational aspirations eliminated differences in well-being for cohabitators and married women, except for those currently in a union. These results imply that once women are selected based on education (i.e. lower education), marriage no longer matters. For men, however, educational aspirations do not completely diminish the benefits of marriage; for low educated men, those who were married still had higher well-being, except for those currently married with children. Hence, marriage may still provide an advantage to men who are more disadvantaged, potentially indicating that marriage is an indicator of social control (Umberson 1992), commitment, and enforceable trust (Cherlin 2000).

Finally, the results demonstrate that the role of childhood psychological attributes differs somewhat between men and women. Men who have low psychological well-being at age 16 are more likely to cohabit at age 42, but marriage is unlikely to boost their mental well-being if they are in long-term cohabiting relationships with the mother of their children. Among women who are less likely to marry, however, marriage would boost well-being, except for women in first, long-term unions with children. These results imply that women with mental health issues may benefit from marriage, potentially because marriage signals greater stability and long-term social support (Ross 1995, Waite and Gallagher 2000).

This study has demonstrated the importance of early childhood conditions for understanding the relationship between cohabitation, marriage, and mental well-being. While previous studies comparing outcomes between cohabitation and marriage have generally controlled for contemporaneous selection effects (e.g. Lamb et al 2003) or unobserved heterogeneity (e.g. Musick and Bumpass 2012, Soons et al 2009), to our knowledge none has specifically examined how selection mechanisms

dating back to childhood explain the differential effects of marriage. Our study provides further evidence that early childhood conditions are important for understanding later life well-being (Elo 2009, Kuh et al 2004). While we found that all of the childhood characteristics together eliminate differences between cohabitation and marriage, we also found some interesting differences between the three domains of childhood selection factors and gender, as described above. Of course, the three domains are interrelated, and it is impossible to know to what extent parental socioeconomic background and family structure explain educational attainment or psychological attributes; in addition, the effects may be reciprocal, i.e. childhood behavioral difficulties could strain the parents' marriage and lead to divorce. Nonetheless, taken together, these background characteristics all play strong role in eliminating differences between cohabitation and marriage. Hence, in order to improve mental well-being, policy makers should focus on reducing the adverse effects of disadvantage in childhood and improving mental well-being in adolescence, rather than legislating incentives to marry in adulthood.

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