Health Consequences of Same and Opposite-Sex Unions: Partnership, parenthood, and cardiovascular risk among young adults

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Running head: Partnership, parenthood, and cardiovascular risk

ABSTRACT

We use the National Longitudinal Survey of Adolescent to Adult Health to examine union and parenthood differences across same and opposite-sex couples in systolic and diastolic blood pressure (SBP and DBP), C-reactive protein (CRP), and abdominal adiposity (waist circumference) among partnered (dating, cohabiting, married) young adults ages 25-33. Relative to women dating men, women cohabiting with women reported lower diastolic blood pressure and were less likely to have high C-reactive protein. Mothers reported lower systolic and diastolic blood pressure than non-mothers, but were more likely to have high waist circumference if they lived with a biological or step-child. Among men, nonresidential fathers reported higher diastolic blood pressure than nonfathers, and married men were more likely to have high waist circumference than men dating an opposite-sex partner. Same-sex cohabitation was neither a risk factor nor a health resource for men. Although the sample sizes for same-sex couples are quite small compared with those for opposite-sex couples, this study provides initial insight that occupying a sexual minority status while partnered is associated with some health benefits and few or no health risks relative to those who are dating an opposite sex partner.

Keywords: marriage, cohabitation, parenthood, cardiovascular risk, young adults

Introduction

Researchers have long documented the health benefits of social relationships, often finding that the married have lower levels of mortality, report fewer risky behaviors such as smoking or drinking, and have access to greater socioeconomic resources that help to maintain good health (Umberson, Crosnoe, & Reczek 2010; Burke et al. 2004; Harris, Lee, & DeLeone 2010; Nomaguchi & Bianchi 2004). Yet increasing rates of cohabitation and nonmarital fertility make it important to examine the ways that a more diverse array of social relationships – not only marriage but also cohabitation and parenthood, in both same and opposite-sex unions – are associated with biological risk factors during young adulthood.

Marriage is not a panacea for the greater health risks (e.g. binge drinking, unhealthy eating, poor sleep habits) associated with an extended transition to adulthood (Frech 2014). To this end, scholars have begun to uncover health *risks* of social relationships early in the life course -- including marriage but also cohabitation and parenthood -- many of which are attributable to increases in BMI and declines in physical activity (Bellows-Riecken & Rhodes 2008; Burke et al. 2004; Harris, Lee, and DeLeone 2010; Nomaguchi and Bianchi 2004). This body of research has found that for the married, cohabiters, or new parents, blood pressure and BMI are often greater, smoking or drug use may increase, and physical activity is less frequent and shorter in duration (Burke et al. 2004; Harris, Lee, and DeLeone 2010; Nomaguchi and Bianchi 2004).

In this study we examine whether *biological risk factors* associated with cardiovascular health, such as high systolic and diastolic blood pressure, elevated C-reactive protein (a measure of inflammation), and high waist circumference (a cardiovascular risk factor and a measure of abdominal adiposity) are associated with *social relationships* -- cohabitation, marriage, or

parenthood -- for young men and women in same and opposite-sex relationships. The focus on cardiovascular risk is important, as heart disease is still the leading cause of mortality in the United States (Kochenak et al. 2014) and hypertension-related deaths have been steadily increasing since the year 2000 (Kung and Xu 2015).

We propose that the social support associated with residential partnership will reduce biological risk in same and opposite-sex couples alike when compared to peers who are dating but not living with an opposite-sex partner (Uchino 2006). To preview our findings, we show that sexual minority status does not pose a significant health risk for young adults in cohabiting relationships; women cohabiting with women had lower diastolic blood pressure and were less likely to have high C-Reactive protein than women in opposite-sex dating relationships. For men, sexual minority status while partnered was neither a health benefit nor a health risk.

Background

Scholars' increasing access to biomarkers of cardiovascular risk that were previously available only in community studies or clinical populations have led to rapid growth in research investigating social relationships and health risks such as hypertension, increasing waist circumference, BMI, and cholesterol. Though it may be the case that the married fare worse across some of these cardiovascular indicators, on average, marriage itself appears to be no less beneficial for health than it has been in the past (Liu 2009). For many outcomes, including self-rated health and mortality, the married continue to report significantly better health than same or opposite-sex cohabiters and singles (Denney et al. 2013; Liu & Reczek 2012), in part due to the socioeconomic, psychosocial, and health monitoring resources associated with marriage (Liu et al. 2013; Liu & Reczek 2012).

Biological indicators of health, personal relationships, and stress

In this study, we investigate associations between social relationships and biological indicators that have been identified as risk factors for cardiovascular disease. Systolic and diastolic blood pressure (hereafter SBP and DBP) are valid and reliable predictors of future morbidity and mortality (Nwankwo, Yoon, Burt, & Gu, 2013). Hypertension – a systolic score of greater than 140 or a diastolic score greater than 90 – may be especially worrisome during young adulthood, as over time many young adults experience declines in the behaviors that would otherwise improve blood pressure, such as maintaining a healthy weight. Waist circumference, above and beyond other measures of obesity such as BMI, is linked to both diabetes and cardiovascular disease (Janiszewski et al. 2008). Waist circumference is also associated with an increased likelihood of future cardiovascular events such as stroke or myocardial infarction (de Koning et al. 2007). C-Reactive protein (CRP), a marker of inflammation, is also linked to cardiovascular risk. A recent meta-analysis of prospective studies on individuals without history of cardiovascular disease demonstrated that CRP improved prediction of first cardiovascular event (The Emerging Risk Factors Collaboration 2012). High levels of CRP or high waist circumference may be somewhat uncommon for younger adults but nonetheless indicates a stress response that may have social causes (Brummett et al. 2012; Brummett et al. 2011). Examining difference in these outcomes in this stage of the life course is important because even minor differences may indicate paths for future health disparities.

To the degree that social relationships are protective of stress and help to manage health, we expect that those who are in more stable, residential partnerships – particularly, married or cohabiting – will report lower CRP, waist circumference, and blood pressure than those who are

partnered but in dating relationships. Social relationships may protect from cardiovascular risk factors by providing individuals with a sense of self-worth and motivation to engage in good health behaviors, making it more likely that an individual will maintain a healthy weight, engage in physical activity, and avoid smoking, the proximate factors leading to hypertension (Yan et al. 2003). Structural resources that position individuals in a social hierarchy, such as income, employment, and education, shape individuals' environments by providing access to health insurance, job stability and higher job satisfaction, safe neighborhoods, and time and monetary resources that make it more likely for an individual to exercise regularly and eat healthfully (Link & Phelan 1995). These resources are more common in marriage, and may reduce the likelihood that one will develop cardiovascular disease as a young adult (Liu et al. 2013).

Differences by sexual minority status

Scholars have recently documented the biological toll that occupying a sexual minority status may take on health, showing that men and women identifying as sexual minorities (including gay, bixesual, or "mostly heterosexual") are at greater risk of STIs, problem drinking, hypertension, and unhealthy BMI (Dermody et al. 2014; Frost, Lehavot, & Meyer 2015; Katz-Wise et al. 2014; Everett & Mollborn 2014; Mojola & Everett 2012; Hatzenbuehler, McLaughlin, & Slopen 2013). Almost no prior research has documented whether the health risks of occupying a sexual minority status are "counterbalanced" by the social support associated with a close personal relationship such as cohabitation. Reczek (2012) is a notable exception, finding that healthy and unhealthy diet and exercise habits can unilaterally or bilaterally transfer across men and women in long-term same-sex relationships. We hypothesize that although occupying a sexual minority status is stressful (see Frost et al. 2015), not all who occupy this

status are equally at risk: we expect that the health monitoring and social support of a same-sex cohabiting relationship will be associated with lower biological risk than peers who are dating an opposite-sex partner.

Data and Methods

The National Longitudinal Study of Adolescent to Adult Health is a multiwave, nationally representative, school-based study of adolescents transitioning into adulthood. In-home interviews for Wave I (N=20,745) were collected in 1995, and included youths enrolled in grades 7-12 during the 1994-1995 school year. The most recent wave of data (Wave IV, N=15,701) were collected in 2008-2009, when respondents were 24-32 years of age (Harris et al. 2009). Over 75% of the Wave I sample interview at Wave IV, of whom only 2% refuse to provide biomarkers of health. Our sample excludes women who are pregnant at Wave IV or believe they might be pregnant, those who are missing sample weights at Wave IV, those who consented to biomarker collection but are missing one or more biomarkers, and those who are not in a same- or opposite-sex dating, cohabiting, or married partnership. We impute missing data for all other variables using the *ice* command for multiply imputed data in Stata 12. The final sample includes 4,039 women and 3,907 men, of which there are 42 women and 39 men who are same-sex cohabiters, 920 women and 873 men who are opposite-sex cohabiters, 35 women and 38 men in same-sex dating relationships, 794 women and 945 men in opposite-sex dating relationships, and 2248 women and 2012 men married to an opposite-sex spouse. Although our sample sizes for respondents in same-sex unions are low, this research remains important in that it provides us with an initial portrait of the well-being of sexual minority individuals in residential and nonresidential partnerships.

Measures

Dependent Variables. *Systolic and diastolic blood pressure (SBP, DBP)*. Blood pressure is measured between one and three times at Wave IV by a trained interviewer. SBP and DBP are each coded as the average of the second and third trials for nearly all respondents (about 97% of the sample), and any two available trials if three are not available. For about 1% of respondents, a single trial is recorded. *C-reactive protein*. CRP is dichotomized such that a score of 3mg/DL -8mg/DL indicates inflammation, and lower scores indicate low risk. Scores greater than 8 mg/DL suggest an acute infection and are excluded from analyses. *Waist circumference.* High waist circumference, or abdominal adiposity, indicates greater risk of high cholesterol, insulin resistance, and Type-II diabetes. We use separate cutoffs for men and women, where waist circumference of greater than 88cm indicates high risk for women, and 102cm for men (Hatzenbuehler et al. 2014).

Independent Variables. *Union status*. At Wave IV, we assign individuals to one of five mutually exclusive and exhaustive categories of union status according to respondent self-reports of current relationship status, including opposite-sex dating (reference), same-sex dating, same-sex cohabiting, opposite-sex cohabiting, and opposite-sex married. Analyses are stratified by gender. *Parenthood.* Parenthood is trichotomized such that 0=nonparent, 1= lives with a biological or step-child, and 2=biological parent not living with a child, according to the Wave IV household roster and fertility record. Those who live with a child part-time are coded as "1" if the respondent includes the child on the household roster. Those who report a live first birth but do not report that child on the household roster are coded as "2" unless the fertility record indicates that the child was put up for adoption or never lived with either biological parent.

Other explanatory variables. *Race-ethnicity, U.S. nativity, age,* and *gender* are self-reported at

Wave I and controlled for in all models. *Health status and health behaviors* include Wave IV measures of psychological distress (using a logged 9-item CES-D scale, higher levels indicate greater distress (Radloff 1977)), body mass index (BMI, centered at 25), smoking status (current daily smoker, previous or intermittent smoker, and non-smoker [reference] (Hatzenbuehler, Slopen, & McLaughlin 2014; Hatzenbuehler, McLaughlin, & Slopen 2013)), heavy drinking (consumed 4 or more drinks if female or 5 or more drinks if male more than once a month over the twelve months (Hatzenbuehler et al. 2014)), and physical inactivity (did not engage in any physical activity in the last week, including yard work, team or individual sports, running or cycling, and walking) (Harris 2010). *Socioeconomic status,* also measured at Wave IV, is evaluated with the respondent's educational attainment (less than high school, high school, and college degree, with some college as reference), material hardship (respondent reports trouble making ends meet or paying bills in the last year), and household income (trichotomized as less than $30,000 a year, more than $75,000, and between $30,000-$75,000 [reference].

Selection. Add Health only collects biomarkers at Wave IV, giving us cross-sectional associations between union and parenthood status and cardiovascular risk. To limit selection concerns, we control for Wave IV variables that are likely to be correlated with union status, parenthood, and health, including health behaviors and health status, socioeconomic status, and demographic variables. We also attempt to limit concerns that healthier individuals will select into unions by comparing health across *partnered* individuals. By making those who are in a current dating relationship our reference category, and by excluding those who are not in dating, cohabiting, or married relationships, we limit some selection concerns related to whether individuals who have a difficult time forming partnerships are also more likely to be in poor health.

Table 1

Analytic strategy

We estimate associations between social relationships and cardiovascular risk during young adulthood using gender-stratified models that are weighted to reflect Add Health's complex sampling design and attrition since Wave I. Ordinary Least Squares (OLS) regressions are used to examine systolic and diastolic blood pressure (SBP, DBP), which are normally distributed. CRP and waist circumference (WC) are dichotomized and analyzed using logistic regression. Weighted descriptive statistics for the sample (stratified by gender and relationship status at Wave IV) are shown in Table 1. Because prior research has found that conventional threshold tests of statistical significance (specifically, a two-tailed test at $p<.05$) are too restrictive in studies with small cell sizes, we note statistical significance at the two-tailed, $p<.10$ level (see Stacey & Biblarz 2001).

Results

Table 1 provides an initial portrait of our sample across outcome and explanatory variables. Dating women – whether with a same or opposite-sex partner – report average SBP above 120 mmHg, the threshold for prehypertension. DBP is similarly higher among dating women relative to marrieds and cohabiters. Most women – a majority of each category across union status – report a waist circumference above 88cm, the threshold for abdominal adiposity. Same-sex (SS) cohabiting women demonstrated a very low likelihood of having high CRP (5.77%) relative to all other partnered women. Opposite-sex (OS) married and OS cohabiting women were most likely to be residential parents.

For men, prehypertension is normative across union statuses, with all groups averaging

above 120mmHg SBP and 80mmHg DBP. Men had lower rates of abdominal adiposity than women, with OS married men reporting the highest prevalence (39.02%). As with women, SS cohabiting men had the lowest likelihood of having high CRP levels. Men were far less likely to be residential parents compared to women, while OS married and OS cohabiting men were most likely among men. In sum, there is variation across all four outcomes according to union status, and in our regressions we further investigate the associations between union and parenthood status and cardiovascular risk.

Table 2

Systolic Blood Pressure (SBP)

Table 2 includes weighted OLS regressions predicting systolic blood pressure by union type. For men, neither union nor parenthood status was protective of men's overall greater risk of high SBP: Models 1-3 of Table 2 did not reveal significant associations between union status or parenthood with systolic blood pressure. Binge drinking more than once a month and higher BMI were associated with higher SBP for men. For women, Table 2 indicates that union status was not associated with systolic blood pressure, but parenthood was associated with lower SBP: women who were parents reported lower SBP than women who were not, including both residential and nonresidential mothers (though only 65 women were nonresidential parents). Binge drinking more than once a month, physical inactivity, and higher BMI were also associated with higher SBP for women.

Table 3

Diastolic Blood Pressure (DBP)

Model 1 of Table 3 shows that parenthood, but not residential union status, was associated with men's diastolic blood pressure (DBP). Men who were nonresidential parents

reported higher DBP than nonparents. Adjusting for health behaviors and SES, same-sex dating men also reported higher DBP than peers dating an opposite-sex partner. Physically inactive men, men with higher BMIs, and men who binge drank more than once a month also reported higher DBP. For women, same-sex cohabiters and parents (both residential and nonresidential) reported lower DBP than opposite-sex daters in adjusted models. Physically inactive women and women with higher BMIs also reported higher DBP, and higher income women reported lower DBP.

Table 4

Waist circumference

Abdominal adiposity – a waist circumference measuring greater than 102cm for men or 88cm for women – is associated with insulin resistance, Type-II diabetes, and greater cardiovascular risk (Wang et al. 2005). For Add Health youth, 40% of whom are obese at Wave IV, this measure can help differentiate who is at greatest risk for comorbidities related to excess weight. Men in opposite-sex marriages reported a greater likelihood to report abdominal adiposity across our models compared with men in opposite-sex dating relationships. For women, residential mothers were more likely to report high waist circumference.

Table 5

C-reactive Protein

Table 5 shows that high CRP was not associated with union status or parenthood for men. Relative to those in opposite-sex dating relationships and to non-parents, those in unions and those who are parents report statistically similar levels of CRP. Adding health-related behaviors (Model 2 of Table 5) and socioeconomic status (Model 3) reveal that for men, only BMI and daily smoking differentiate men's risk for high inflammation. Smokers and those with greater

BMIs are more likely to report high inflammation, and men not born in the US are less likely to report high CRP. For young men in this sample, socioeconomic status was not associated with CRP.

For women, CRP is associated with union status but not parenthood. Relative to those in opposite-sex dating relationships, same-sex cohabiters were less likely to report high inflammation, indicating a health protective effect. This finding is robust to health behaviors significantly associated with CRP, including smoking, BMI, and physical inactivity. This provides support for our hypothesis that residential romantic relationships can be health-protective, but our results support these relationships only for same-sex cohabiting women. As with men, socioeconomic indicators, including education, income, and material hardship, were not associated with CRP.

Figure 1

Figure 2

We summarize our results, by outcome, in Figures 1 and 2. Figure 1 includes our continuously measured outcomes, systolic and diastolic blood pressure, and shows that same-sex cohabiting women reported lower diastolic blood pressure than opposite-sex dating women while same-sex dating men reported higher diastolic blood pressure than opposite-sex dating men in adjusted models. Figure 2 includes our outcomes that use dichotomous cutpoints. We see that men in opposite-sex marriages report higher risk than opposite-sex daters (for high WC) in unadjusted and adjusted models, and same-sex cohabiting women report a lower risk of high CRP than opposite-sex dating women in adjusted and unadjusted models.

Discussion

Scholars have brought new attention to the health protecting and health-damaging relationships between union status, parenthood, and partnership through the introduction of biological markers of data, including those related to cholesterol, hypertension, and BMI (Burke et al. 2004; Mokdad et al. 2004). In addition, a new body of literature has documented that sexual orientation is associated with health behaviors and health risks, raising the issue of whether same-sex partnerships may be a risk factor or resource for health. We add to this discussion by demonstrating that same-sex partnership status is sometimes associated with cardiovascular health net of health behaviors, socioeconomic status, and demographic characteristics. In particular, residential same sex cohabitation – specifically for women – are associated with better cardiovascular health, including a lower likelihood to report high CRP and lower diastolic blood pressure.

Previous studies have resulted in mixed findings regarding the relationships between union and parenthood status and cardiovascular risk factors. This study shows that the relationships between parenthood, marriage, cohabitation, and cardiovascular risk are not strongly associated during young adulthood, *except* for some same-sex respondents. We speculate that at this stage of the life course, differences in health risks are small across groups (though overall incidence is quite high) but likely widen later in the life course. We urge future studies to account for selection into unions when continuing to clarify the relationships between social relationships and young adult health.

Limitations

This study provides a rich analysis of the ways in which same and opposite-sex social

relationships are associated with biological risks for young adults, but our results are unable to clarify whether the associations described above are a result of causation (some social relationships cause improved health) or selection (health status is in place before social relationships are established). We are also limited by the timing of data collection, which may underestimate the health benefits or overestimate the health risks of same-sex partnerships. The Add Health Wave IV data were collected in 2008-2009, a time when same-sex marriages were not legally recognized in 47 states (Massachusetts, Connecticut, and Iowa were exceptions) and were legally banned in 13 states. Same-sex romantic unions were likely to be more stigmatized than our current status, where the Supreme Court recently ruled that all fifty states must allow legal marriages among same sex couples. This change in climate may mean that if the study were to be conducted today, same-sex cohabiters and daters might fare even better relative to opposite sex dating peers, and a study of same-sex marrieds would also be feasible.

We are also limited by sample size and the narrow age range of our sample, composed entirely of young adults ages 24-32. We have fewer than fifty same-sex dating or cohabiting women and men in each category we analyze, and our small sample sizes for these groups make it more difficult to find statistically significant associations between these respondents and those in categories with larger sample sizes. This limits the reliability and generalizability of our findings, especially any findings that indicate null differences between groups. It could be that a lack of statistical power, rather than a lack of a true association between the variables, is the reason that we do not find more significant relationships between union status and biological risk. However, as we show in Table A (see Appendix), we are encouraged that the dispersion (the ratio of the sample standard deviation to the sample mean) of our continuously measured outcome variables (SBP and DBP) is similar for those in same-sex and opposite-sex unions. This

suggests that subgroup variation in blood pressure across union status is consistent, strengthening our argument that any statistically significant differences identified are due to true variation between groups and not to sample size differences across subgroups. Yet it also demonstrates that any null associations may be due to small sample size, and not to a lack of true subgroup variation. Despite these limitations, no other data that we know of offers a population-based, nationally representative sample of young adults in both same and opposite-sex relationships as well as measures of biological risk. We encourage future research to investigate the relationship between social relationships, union type, and biological risk factors over time and with larger samples to better understand the ways in which social relationships get under the skin.

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Table 1. Weighted descriptive statistics of all variables by union status. Standard deviations in parentheses for all continuously measured variables. (N= 4,039 women and 3,907 men).

	Men					Women				
	OS dating	SS cohabiting	OS cohabiting	SS dating	Married	OS dating	SS cohabiting	OS cohabiting	SS dating	Married
Outcome variables										
Systolic Blood Pressure	129.62	129.67	129.28	132.43	129.39	120.01	119.07	119.39	123.84	118.33
	(11.77)	(10.67)	(12.86)	(14.33)	(11.84)	(11.67)	(10.04)	(12.90)	(11.08)	(11.89)
Diastolic Blood pressure	81.34	85.79	81.62	84.73	81.42	77.31	74.90	76.31	77.16	75.88
	(9.49)	(11.84)	(10.12)	(9.39)	(9.31)	(9.26)	(9.45)	(10.10)	(7.36)	(9.39)
High waist circumference	29.81%	15.65%	33.54%	26.76%	39.02%	55.68%	45.45%	59.71%	56.25%	60.21%
Elevated C-Reactive protein (Inflammation=1)	21.80%	16.16%	25.91%	21.02%	24.11%	32.40%	5.77%	35.95%	39.36%	35.53%
Explanatory variables, Wave IV										
Residential parent	6.46%	5.13%	40.44%	5.26%	69.98%	40.18%	19.05%	53.15%	11.43%	73.98%
Nonresidential parent	15.66%	0.00%	9.39%	5.26%	2.34%	3.27%	2.38%	2.17%	5.71%	0.36%
Age in years	28.05	28.32	28.21	29.00	28.83	28.05	27.69	27.78	27.88	28.49
	(1.81)	(1.53)	(1.77)	(1.74)	(1.71)	(1.77)	(1.69)	(1.82)	(1.90)	(1.66)
Non-Latino white (ref)	51.22%	58.97%	59.56%	31.58%	65.16%	43.58%	50.00%	60.76%	42.86%	67.48%
Non-Latino black	26.24%	5.13%	19.24%	28.95%	11.83%	31.11%	28.57%	18.59%	37.14%	9.61%
Latino/Latina	16.31%	26.47%	15.48%	29.03%	17.45%	16.84%	21.05%	14.55%	12.90%	16.81%
Asian	6.46%	7.69%	4.93%	13.16%	5.73%	7.81%	0.00%	6.54%	2.86%	6.05%
Other	.95%	2.56%	1.60%	0.00%	1.39%	2.14%	0.00%	0.76%	5.71%	1.38%
Non US-native	3.08%	0.00%	1.75%	0.70%	4.53%	3.40%	11.54%	3.84%	3.10%	3.72%
Health status and behaviors										
Psychological distress (CES-D, logged)	.011	.472	-.267	1.07	-.565	.896	.887	.572	.530	-.207
	(4.80)	(3.97)	(4.60)	(2.94)	(4.41)	(3.72)	(5.29)	(4.26)	(3.06)	(4.41)
Infrequent/no binge drinking in last year (ref) (ref)	61.80%	86.89%	68.40%	37.27%	79.69%	77.34%	55.33%	78.90%	54.68%	90.36%
Binge drinks more than 1x / month	38.20%	13.11%	31.60%	23.87%	20.31%	22.66%	44.67%	21.10%	45.32%	9.64%
Non-smoker (ref)	51.11%	33.33%	37.34%	55.27%	52.04%	55.61%	45.23%	44.02%	48.57%	60.14%
Current daily smoker	23.81%	17.95%	31.16%	23.68%	19.73%	19.02%	14.29%	29.57%	28.57%	15.75%
Intermittent or previous smoker	25.08%	48.72%	31.50%	21.05%	28.23%	25.37%	40.48%	26.41%	22.86%	24.11%
Body Mass Index (BMI), centered at 25	2.92	.774	3.38	1.88	4.19	2.37	2.29	1.93	2.51	2.23
	(5.68)	(4.41)	(5.77)	(8.81)	(5.78)	(6.86)	(6.35)	(6.14)	(6.14)	(6.36)
Physically inactive	18.43%	25.06%	31.34%	21.45%	28.80%	30.13%	40.36%	33.92%	48.87%	28.49%
Socioeconomic status										
Education (ref = some college)	42.54%	48.72%	43.99%	31.58%	47.01%	45.21%	66.67%	47.07%	42.86%	42.58%
Less than HS degree	7.09%	2.56%	12.83%	5.26%	7.26%	5.67%	4.76%	8.91%	5.71%	4.14%
High school graduate	16.93%	5.13%	21.19%	13.16%	16.90%	8.94%	2.38%	15.11%	17.14%	13.17%
College graduate	33.44%	43.59%	21.99%	50.00%	28.83%	40.18%	26.19%	28.91%	34.29%	39.81%
Experienced material hardship	21.78%	15.93%	29.17%	28.58%	18.67%	31.45%	38.81%	34.74%	19.04%	20.37%
Income is above 75K	39.58%	51.28%	31.16%	15.79%	41.75%	30.23%	38.10%	31.30%	25.71%	42.26%
Income is below 30K	17.14%	7.69%	21.76%	23.68%	10.09%	27.33%	19.05%	23.37%	37.14%	10.05%
N	945	39	873	38	2012	794	42	920	35	2248

Note: Full description of all variables can be found in the Measures section (pp.7-8).

Table 2: OLS regression of systolic blood pressure by union and parenthood status, parentheses enclose 95% confidence intervals (N= 4,039 women and 3,907 men).

	Men			Women		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Union and parenthood status						
Opposite-sex dating (ref)						
same-sex cohabiting	.372	1.934	2.031	-1.026	-2.007	-1.835
	(-3.931 to 4.676)	(-2.648 to 6.515)	(-2.600 to 6.662)	(-4.656 to 2.603)	(-5.579 to 1.565)	(-5.474 to 1.805)
opposite-sex cohabiting	-.430	-.513	-.559	-.134	-.076	-.106
	(-2.032 to 1.172)	(-2.131 to 1.105)	(-2.186 to 1.067)	(-2.001 to 1.733)	(-1.943 to 1.791)	(-2.017 to 1.814)
same sex dating	2.772	3.508	3.339	2.893	1.360	1.278
	(-2.670 to 8.214)	(-1.513 to 8.529)	(-1.542 to 8.220)	(-.959 to 6.747)	(-1.842 to 4.563)	(-1.967 to 4.523)
opposite sex married	-.155	-.145	-.064	-.905	-.601	-.493
	(-1.911 to 1.601)	(-1.920 to 1.612)	(-1.805 to 1.678)	(-2.433 to .621)	(-2.113 to .910)	(-1.995 to 1.009)
Residential parent	.006	-.325	-.298	**-1.175**†	**-2.186****	**-2.346*****
	(-1.259 to 1.271)	(-1.586 to .935)	(-1.620 to 1.025)	(-2.394 to .045)	(-3.401 to -.970)	(-3.582 to -1.110)
Nonresidential parent	1.414	1.421	1.416	**-3.453***	**-4.261****	**-4.686****
	(-.872 to 3.69)	(-.755 to 3.597)	(-.768 to 3.600)	(-6.463 to -.443)	(-7.187 to -1.336)	(-7.624 to -1.747)
Health status and behaviors						
Psychological distress		.009	.010		-.092	-.107
		(-.094 to .112)	(-.091 to .112)		(-.216 to .032)	(-.239 to .025)
Heavy drinker		**2.279*****	**2.335*****		**1.951***	**2.030***
		(1.192 to 3.366)	(1.262 to 3.408)		(.308 to 3.594)	(.420 to 3.640)
Current daily smoker		.192	.196		.864	.662
		(-1.143 to 1.528)	(-1.068 to 1.459)		(-.415 to 2.143)	(-.692 to 2.017)
Previous or intermittent smoker		.383	.374		.206	.184
		(-.795 to 1.562)	(-.808 to 1.557)		(-.847 to 1.260)	(-.898 to 1.267)
BMI, centered at 25		**.516*****	**.525*****		**.646*****	**.639*****
		(.374 to .588)	(.428 to .622)		(.566 to .725)	(.559 to .717)
Physically inactive		.292	.287		**1.408***	**1.407***
		(-.895 to 1.481)	(-.897 to 1.472)		(.253 to 2.563)	(.239 to 2.575)
Socioeconomic status						
Education (ref = some college)						
Less than high school			**2.086**†			1.903
			(-.078 to 4.251)			(-.455 to 4.262)
High school graduate			1.028			.717
			(-.614 to 2.670)			(-.589 to 2.023)
College graduate			1.120			.529
			(-.236 to 2.477)			(-.986 to 2.045)
Experienced material hardship			-.586			.078
			(-1.924 to .751)			(-1.274 to 1.431)
-Income is above 75K			-.169			**-1.052***
			(-1.492 to 1.153)			(-2.06 to -.038)
-Income is below 30K			.411			-.154
			(-1.200 to 2.023)			(-1.652 to 1.344)
Constant	**122.47***** (112.634 to 132.316)	**121.64***** (112.464 to 130.817)	**120.76***** (111.548 to 129.977)	**107.74***** (98.755 to 116.720)	**107.28***** (98.849 to 115.705)	**106.70***** (98.135 to 115.273)
R^2	.006	.076	.079	.019	.138	.141

†p <.10, *p <.05, **p <.01, ***p <.001

Note: Models 1 and 3 present baseline associations between the dependent variable and parenthood and union status. Models 2 and 4 include controls for health status and health behaviors, and Models 3 and 6 present a model adjusted for all controls listed in Table 1. Bolding indicates statistical significance of p <.05. All models adjust for age, race-ethnicity, US nativity, and for the complex survey design of the Add Health data.

Table 3: Ordinary Least Squares regression of diastolic blood pressure by union and parenthood status, parentheses enclose 95% confidence intervals (N= 4,039 women and 3,907 men).

	Men			Women		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Union and parenthood status						
Opposite-sex dating (ref)						
same-sex cohabiting	3.175	4.190	4.362	-2.234	**-2.762†**	**-2.662†**
	(-3.059 to 9.409)	(-2.357 to 10.737)	(-2.170 to 10.894)	(-5.068 to .600)	(-5.631 to .106)	(-5.603 to .278)
opposite-sex cohabiting	.077	-.063	-.116	-.657	-.627	-.652
	(-1.104 to 1.259)	(-1.263 to 1.136)	(-1.316 to 1.085)	(-2.219 to .903)	(-2.185 to .931)	(-2.259 to .956)
same sex dating	3.245	**3.723***	**3.575†**	-.752	-1.638	-1.685
	(-.703 to 7.193)	(.099 to 7.346)	(-.089 to 7.239)	(-3.040 to 1.534)	(-3.872 to .596)	(-3.938 to .568)
opposite sex married	-.358	-.305	-.226	-1.174	-1.044	-.913
	(-1.777 to 1.061)	(-1.675 to 1.064)	(-1.595 to 1.143)	(-2.584 to .236)	(-2.483 to .396)	(-3.938 to .568)
Residential parent	.136	-.296	-.424	-.512	**-1.103***	**-1.322***
	(-.970 to 1.242)	(-1.359 to .766)	(-1.584 to .734)	(-1.499 to .475)	(-2.128 to -.077)	(-2.377 to -.244)
Nonresidential parent	**2.033***	**1.835***	**1.695***	-1.995	**-2.450†**	**-2.852***
	(.491 to 3.574)	(.332 to 3.338)	(.141 to 3.249)	(-4.669 to .679)	(-5.141 to .200)	(-5.511 to -.193)
Health status and behaviors						
Psychological distress		**.073†**	**.068†**		-.034	-.052
		(-.003 to .149)	(-.007 to .144)		(-.115 to .046)	(-.141 to .037)
Heavy drinker		**1.460****	**1.49****		.929	.995
		(.559 to 2.361)	(.588 to 2.392)		(-.329 to 2.187)	(-.236 to 2.22)
Current daily smoker		.717	.530		.219	-.014
		(-.341 to 1.775)	(-.526 to 1.586)		(-.946 to 1.385)	(-1.280 to 1.262)
Previous or intermittent smoker		.443	.382		-.129	-.161
		(-.453 to 1.340)	(-.516 to 1.280)		(-.992 to .735)	(-1.063 to .740)
BMI, centered at 25		**.382****	**.382*****		**.353*****	**.344*****
		(.314 to .449)	(.313 to .451)		(.289 to .417)	(.273 to .386)
Physically inactive		**1.049***	**.993†**		**1.291****	**1.289****
		(.021 to 2.078)	(-.027 to 2.015)		(.463 to 2.118)	(.464 to 2.115)
Socioeconomic status						
Education (ref = some college)						
Less than high school			.577			1.107
			(-1.202 to 2.357)			(-.693 to 2.907)
High school graduate			.166			.593
			(-1.012 to 1.343)			(-.567 to 1.754)
College graduate			-.100			.353
			(-1.139 to .939)			(-.949 to 1.651)
Experienced material hardship			.064			.465
			(-1.036 to 1.163)			(-.540 to 1.471)
-Income is above 75K			-.253			**-.990***
			(-1.198 to .690)			(-1.792 to -.188)
-Income is below 30K			.413			-.205
			(-.811 to 1.638)			(-1.441 to 1.030)
Constant	**64.970*****	**63.864*****	**63.681*****	**62.720*****	**62.451*****	**62.108*****
	(57.668 to 72.273)	(57.184 to 70.543)	(57.128 to 70.234)	(55.988 to 69.452)	(55.992 to 68.911)	(55.426 to 68.789)
R^2	.021	.083	.084	.019	.076	.080

†p <.10, *p <.05, **p <.01, ***p <.001

Note: Models 1 and 3 present baseline associations between the dependent variable and parenthood and union status. Models 2 and 4 include controls for health status and health behaviors, and Models 3 and 6 present a model adjusted for all controls listed in Table 1. Bolding indicates statistical significance of p <.05. All models adjust for age, race-ethnicity, US nativity, and for the complex survey design of the Add Health data.

Table 4: Logistic regressions of high waist circumference, men (waist >101cm) and women (waist > 87cm), parentheses enclose 95% confidence intervals (N= 4,039 women and 3,907 men).

	Men			Women		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Union and parenthood status						
Opposite-sex dating (ref)						
same-sex cohabiting	-.732	-.698	-.706	-.110	-.501	-.486
	(-1.727 to .263)	(-1.709 to .312)	(-1.714 to .302)	(-.931 to .713)	(-2.081 to 1.078)	(-2.055 to 1.083)
opposite-sex cohabiting	.149	.025	-.025	.165	.245	.244
	(-.051 to .378)	(-.429 to .478)	(-.483 to .433)	(-.081 to .412)	(-.101 to .593)	(-.113 to .600)
same sex dating	-.197	-.137	-.282	.448	-.331	-.354
	(-1.295 to .900)	(-1.559 to 1.256)	(-1.925 to 1.361)	(-.549 to 1.44)	(-1.457 to .796)	(-1.495 to .787)
opposite sex married	**.397****	**.409***	**.403***	.114	.210	.212
	(.160 to .634)	(.038 to .779)	(.038 to .768)	(-.136 to .364)	(-.117 to .537)	(-.125 to .550)
Residential parent	.101	-.199	-.251	**.564*****	**.215**†	**.217**†
	(-.119 to .321)	(-.539 to .141)	(-.604 to .101)	(.400 to .727)	(-.019 to .450)	(-.026 to .459)
Nonresidential parent	.059	.132	.041	.476	.003	.013
	(-.432 to .552)	(-.521 to .785)	(-.594 to .677)	(-.292 to 1.24)	(-.978 to .984)	(-.907 to .933)
Health status and behaviors						
Psychological distress		.014	.013		.018	.019
		(-.010 to .039)	(-.012 to .038)		(-.007 to .045)	(-.007 to .046)
Heavy drinker		.100	**.097**†		.025	.019
		(-.179 to .380)	(-.182 to .377)		(-.300 to .350)	(-.310 to .348)
Current daily smoker		.025	-.071		.249	.250
		(-.382 to .434)	(-.496 to .355)		(-.144 to .642)	(-.177 to .676)
Previous or intermittent smoker		**.411****	**.381****		.027	.027
		(.134 to .688)	(.102 to .660)		(-.275 to .330)	(-.274 to .329)
BMI, centered at 25		**.596*****	**.598*****		**.541*****	**.543*****
		(.523 to .669)	(.527 to .670)		(.488 to .593)	(.489 to .596)
Physically inactive		**.396****	**.366****		-.109	-.105
		(.140 to .652)	(.107 to .625)		(-.360 to .144)	(-.354 to .142)
Socioeconomic status						
Education (ref = some college)						
Less than high school			**.518**†			-.354
			(-.016 to 1.05)			(-.947 to .240)
High school graduate			.116			.245
			(-.253 to .486)			(-.141 to .630)
College graduate			-.004			.001
			(-.285 to .276)			(-.278 to .280)
Experienced material hardship			.173			-.013
			(-.216 to .562)			(-.345 to .318)
-Income is above 75K			.033			.063
			(-.264 to .331)			(-.211 to .337)
-Income is below 30K			.104			.171
			(-.301 to .519)			(-.199 to .541)
Constant	**-1.996***	**-3.738****	**-3.978****	-1.292	-1.010	-.997
	(-3.524 to -.467)	(-5.985 to -1.491)	(-6.187 to -1.768)	(-2.849 to .266)	(-3.478 to 1.458)	(-3.477 to 1.544)

†p <.10, *p <.05, **p <.01, ***p <.001

Note: Models 1 and 3 present baseline associations between the dependent variable and parenthood and union status. Models 2 and 4 include controls for health status and health behaviors, and Models 3 and 6 present a model adjusted for all controls listed in Table 1. Bolding indicates statistical significance of p <.05. All models adjust for age, race-ethnicity, US nativity, and for the complex survey design of the Add Health data.

Table 5: Logistic regressions of relationships between union status and high CRP (inflammation =1; values ranging from 3 to 8 mL/DL Indicate chronic inflammation), parentheses enclose 95% confidence intervals (N= 4,039 women and 3,907 men).

	Men			Women		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Union and parenthood status						
Opposite-sex dating (ref)						
same-sex cohabiting	-.233	.040	.048	**-2.122****	**-2.586****	**-2.578****
	(-1.371 to .904)	(-1.080 to 1.160)	(-1.064 to 1.161)	(-3.455 to -.789)	(-4.052 to -1.120)	(-4.057 to -1.100)
opposite-sex cohabiting	.201	.134	.131	.158	.228	.224
	(-.128 to .530)	(-.198 to .466)	(-.196 to .458)	(-.105 to .423)	(-.061 to .517)	(-.071 to .519)
same sex dating	-.015	.132	.098	.367	.268	.286
	(-1.205 to 1.176)	(-1.125 to 1.388)	(-1.174 to 1.371)	(-.709 to 1.443)	(-.754 to 1.29)	(-.734 to 1.30)
opposite sex married	.089	.027	.030	.175	.193	.187
	(-.225 to .404)	(-.295 to .351)	(-.291 to .351)	(-.096 to .447)	(-.092 to .480)	(-.109 to .482)
Residential parent	.185	.039	.011	.057	-.158	-.153
	(-.056 to .425)	(-.208 to .287)	(-.252 to .273)	(-.139 to .252)	(-.373 to .056)	(-.393 to .088)
Nonresidential parent	.170	.114	.089	-.440	-.623	-.626
	(-.246 to .587)	(-.286 to .514)	(-.327 to .505)	(-1.177 to .298)	(-1.428 to .182)	(-1.478 to .226)
Health status and behaviors						
Psychological distress		-.002	-.002		.005	.003
		(-.022 to .017)	(-.022 to .017)		(-.017 to .026)	(-.018 to .025)
Heavy drinker		-.209	-.219		-.003	.004
		(-.463 to .045)	(-.476 to .038)		(-.251 to .245)	(-.243 to .252)
Current daily smoker		**.596*****	**.583*****		**-.263***	**-.264***
		(.329 to .864)	(.312 to .853)		(-.519 to -.006)	(-.503 to -.026)
Previous or intermittent smoker		.140	.141		.090	.092
		(-.124 to .404)	(-.126 to .407)		(-.118 to .299)	(-.120 to .306)
BMI, centered at 25		**.125*****	**.125*****		**.126*****	**.126*****
		(.105 to .146)	(.104 to .146)		(.109 to .143)	(.109 to .144)
Physically inactive		.193	.193		**.264***	**.264****
		(-.053 to .441)	(-.054 to .440)		(.026 to .503)	(.030 to .499)
Socioeconomic status						
Education (ref = some college)						
Less than high school			.230			.174
			(-.204 to .664)			(-.252 to .601)
High school graduate			.150			.058
			(-.165 to .465)			(-.247 to .365)
College graduate			.061			.075
			(-.192 to .313)			(-.164 to .315)
Experienced material hardship			.006			.002
			(-.290 to .302)			(-.243 to .248)
-Income is above 75K			-.085			-.128
			(-.314 to .143)			(-.373 to .117)
-Income is below 30K			-.220			-.122
			(-.548 to .107)			(-.488 to .244)
Constant	**-2.579****	**-3.170*****	**-3.187*****	-.137	.085	.069
	(-4.160 to -.999)	(-4.725 to -1.616)	(-4.731 to -1.643)	(-1.594 to 1.319)	(-1.418 to 1.589)	(-1.407 to 1.545)

†p <.10, *p <.05, **p <.01, ***p <.001

Note: Models 1 and 3 present baseline associations between the dependent variable and parenthood and union status. Models 2 and 4 include controls for health status and health behaviors, and Models 3 and 6 present a model adjusted for all controls listed in Table 1. Bolding indicates statistical significance of p <.05. All models adjust for age, race-ethnicity, US nativity, and for the complex survey design of the Add Health data.

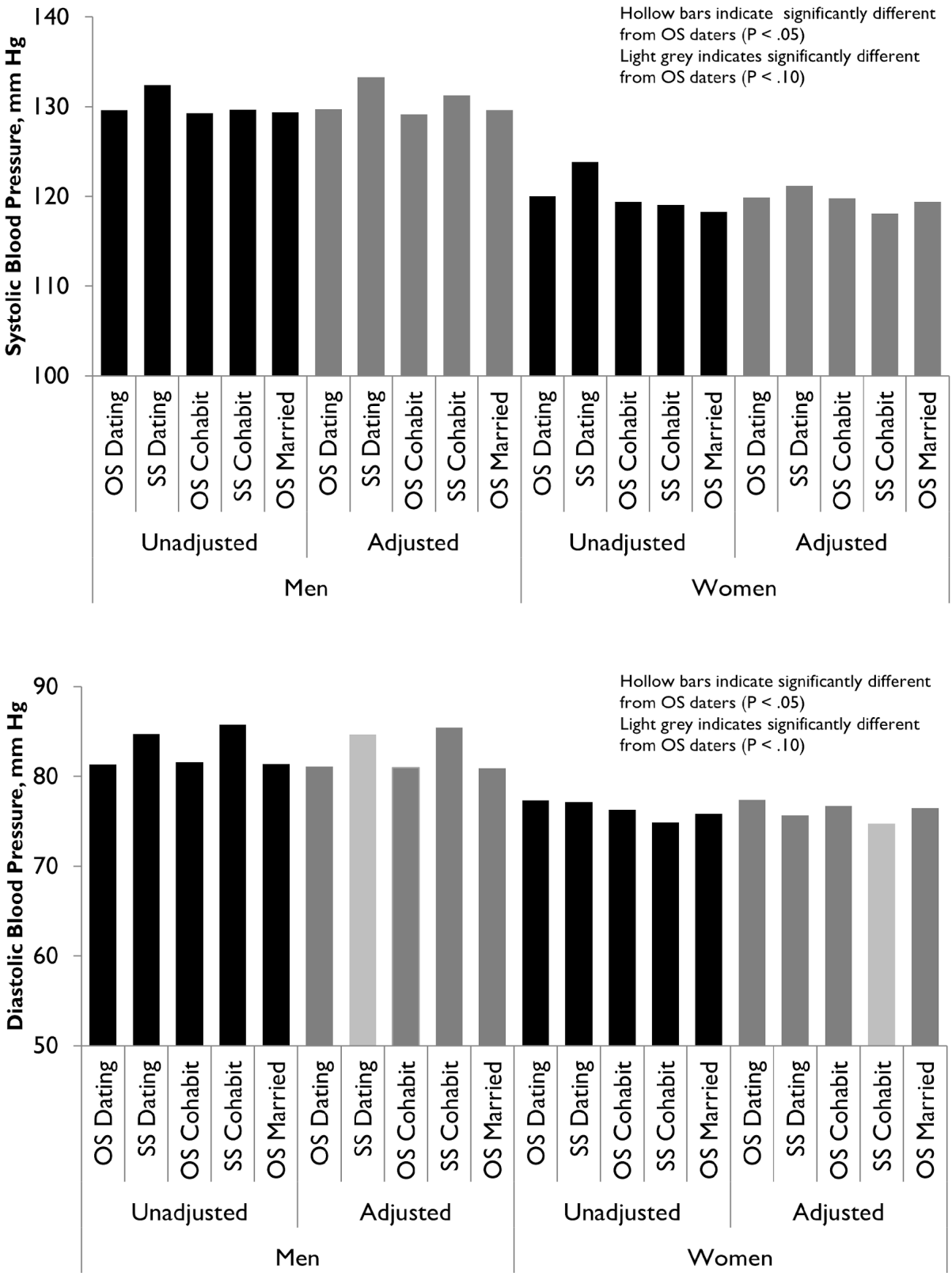

Figure 1. Variation in systolic and diastolic blood pressure by gender. Unadjusted represent category means, adjusted values are calculated predicted values derived from results presented in

Models 3 and 6 in Tables 1 and 2.

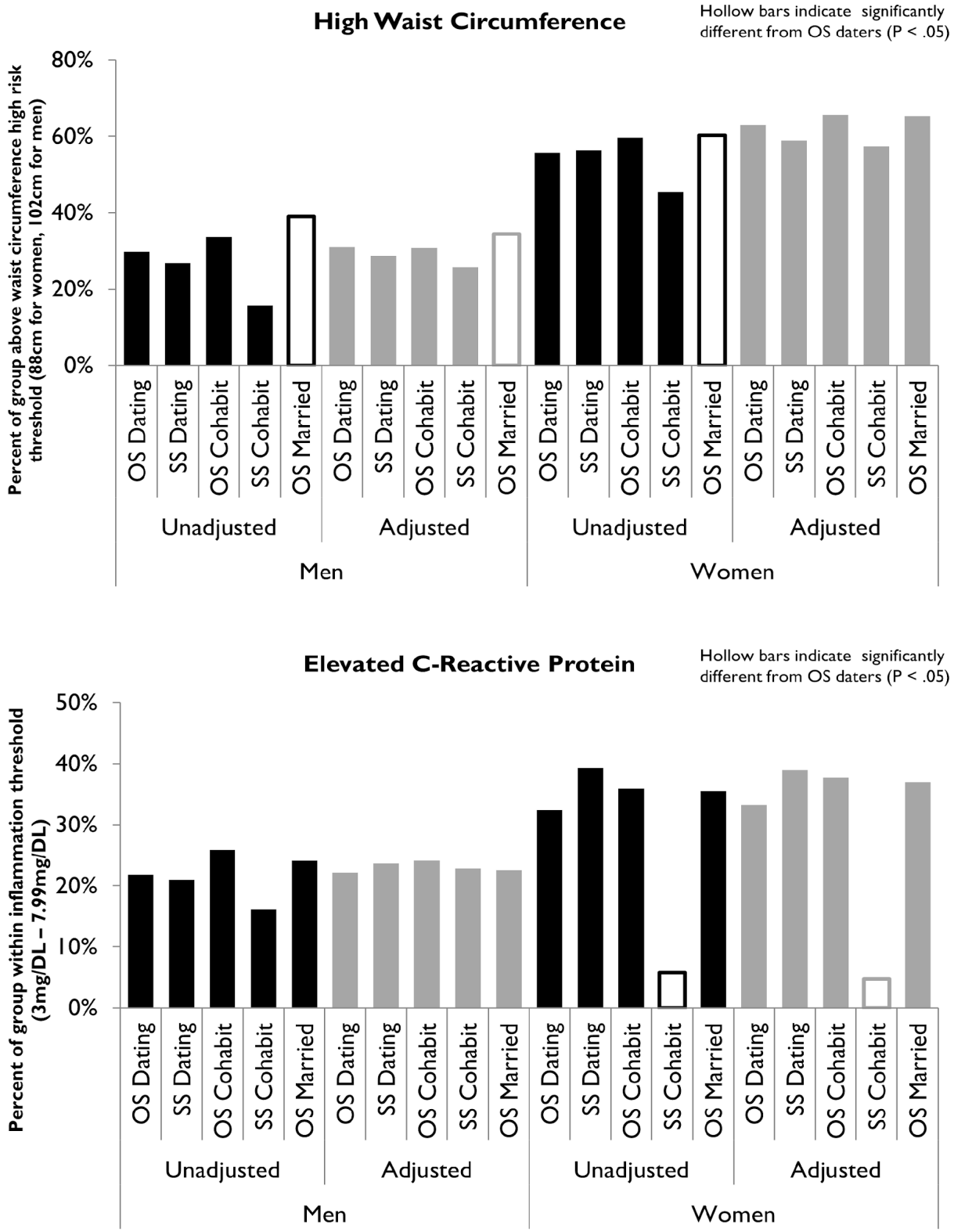

Figure 2. Variation in high waist circumference and elevated C-reactive protein by gender. Unadjusted represent category means, adjusted values are calculated predicted values derived

from results presented in Models 3 and 6 in Tables 3 and 4.

Table A (Appendix). Coefficient of relative variation (dispersion) of systolic and diastolic blood pressure by union type and gender

	Men				
	OS dating	SS cohabiting	OS cohabiting	SS Dating	Married
Continuously measured outcome variables					
Systolic Blood Pressure (mean)	129.62	129.67	129.28	132.43	129.39
Systolic Blood pressure (standard deviation)	11.77	10.67	12.86	14.33	11.84
coefficient of relative variation (sd/mean)	**0.09**	**0.08**	**0.10**	**0.11**	**0.09**
Diastolic Blood pressure (mean)	81.34	85.79	81.62	84.73	81.42
Diastolic Blood pressure (standard deviation)	9.49	11.84	10.12	9.39	9.31
coefficient of relative variation (sd/mean)	**0.12**	**0.14**	**0.12**	**0.11**	**0.11**
	Women				
	OS dating	SS cohabiting	OS cohabiting	SS Dating	Married
Continuously measured outcome variables					
Systolic Blood Pressure (mean)	120.01	119.07	119.39	123.84	118.33
Systolic Blood pressure (standard deviation)	11.67	10.04	12.9	11.08	11.89
coefficient of relative variation (sd/mean)	**0.10**	**0.08**	**0.11**	**0.09**	**0.10**
Diastolic Blood pressure (mean)	77.31	74.9	76.31	77.16	75.88
Diastolic Blood pressure (standard deviation)	9.26	9.45	10.1	7.36	9.39
coefficient of relative variation (sd/mean)	**0.12**	**0.13**	**0.13**	**0.10**	**0.12**

Note: Coefficient of relative variation is the ratio of sample standard deviation to sample mean within subgroups.