Marital status, social control, and health behavior

Dana Hamplová

Institute of Sociology, ASCR

dana.hamplova@soc.cas.cz

Abstract

There is comprehensive empirical evidence that married individuals enjoy healthier and longer life. Although their advantage is often explained in terms of their health-enhancing lifestyle empirical research brings mixed evidence on the lifestyle differences between married and unmarried individuals. The goal of the current paper is to test a hypothesis whether the association between marital status and health-related behaviors is mediated by the prevalence of the behavior in the society. The empirical analysis uses the ISSP 2011 data on health from 26 countries that provide information on smoking, binge drinking, exercising, and vegetable intake. The analyses provide only partial support for the hypothesis. It shows that the gap between married and unmarried individuals narrows with the increasing prevalence in case of smoking and binge drinking and to some extent in case of healthy diet. No effect was however detected in case of physical inactivity.

Background

A large body of research shows that marital status is strongly associated with individuals' health and well-being. Numerous studies from a broad spectrum of scholarly journals and books demonstrate that married people have lower mortality and are healthier and happier than the unmarried (Dupre, Beck and Meadows 2009; Holt-Lunstad, Birmingham and Jones 2008; Koskinen et al. 2007; Liu and Umberson 2008; Murphy, Grundy and Kalogirou 2007). Although selection of healthier individuals into marriage explains some of these differences, it is also often argued that marriage enhances well-being through healthier lifestyle (Lewis and Butterfield 2007; Waite 1995; Yannakoulia et al. 2008). For example, much of the excessive mortality of unmarried population is linked to the behavior-related causes of death, including suicide (Kposowa 2000; Masocco et al. 2008).

Despite the plausibility of the lifestyle argument, the empirical evidence regarding the differences in health-related behaviors of married and unmarried individuals is mixed. While some studies indeed show that married individuals live healthier (Duncan, Wilkerson and England 2006; Yannakoulia et al. 2008), other works did not find any evidence for this claim or even report a negative link (Guo et al. 2004; Zins et al. 2003). Using the social control theory, this paper contributes to the ongoing discussion and explores the question of whether the acceptability of the specific behavior in the broader social networks affects the behavioral differences between married and unmarried individuals. Specifically, the paper focuses on smoking, binge drinking, physical inactivity, and vegetable and fruit intake as these practices are considered to be the key behavioral factors explaining the social disparities in health (Eikemo and Mackenbach 2012).

Conjugal social control and health-enhancing behavior

In the literature of the last two decades, the social control theory has been playing a prominent role in explaining the marital status – health link (Umberson 1987; Umberson 1992). This perspective states that social relationships affect health through "interpersonal interactions that involve influence, regulation, and constraint of health practices" (Lewis and Butterfield 2007, p. 299). The direct social control refers to the rewards for behaviors defined as desirable and sanctions for behaviors that are deemed undesirable, deviant, and health-damaging (Umberson 1987; Westmaas, Wild and Ferrence 2002). The indirect social control operates through the internalization of a sense of obligation to fulfill one's social role and to abstain from the conducts inappropriate for this role (Colman, Missinne and Bracke 2013). Even though some type of social control is an integral part of all social relationships the closer the relationship, the more regulation is usually involved (Lewis et al. 2006). The social control is therefore particularly pronounced in conjugal interactions and marriage is the most consequential social relationship for health (Lewis and Butterfield 2007).

It is plausible to expect that the health-related social control is particularly tenacious if the behavior is considered to be highly undesirable or is linked with certain stigma. The assumption that the intensity of social control varies depending on the relative undesirability of the behavior has an implication for the lifestyle differences between the married and unmarried. If the marital status affects health behavior via social control and if the social control is more stringent for some types of behavior than for others, the differences between the married and unmarried should be larger for behaviors that are more stigmatized. In other words, the attempts to directly influence and control partner's behavior and normative expectations associated with marital roles are likely to be stronger if the behavior attracts stronger social condemnation. In contrast, if the behavior is viewed as relatively benign the

effort to discourage others from engaging in it might be lower and the pressure towards behavioral change might be perceived as illegitimate. This would mean that the differences between married and unmarried individuals might be relatively small.

The argument that the more undesirable behavior is the stronger the conjugal social control also implies that the gap between married and unmarried might be smaller if the prevalence of the behavior is higher. If some objectionable behavior (e.g. smoking and binge drinking) is more common in the society, it is likely to be linked with less stigmatization and lower social sanctions. Consequently, even those whose conducts are more closely monitored and regulated, i.e. married individuals, engage in this behavior more frequently. In contrast, if some health-compromising behavior is rare it is likely to attract more negative reactions. This might increase the observed differences across categories of marital status in two ways. First, those who adopt the behavior might be rendered less desirable marriage partners and thus stay unmarried. Second, if marriage encourages healthy life style through health-enhancing social control, the higher stigmatization is likely to increase the pressure from the spouse. Moreover, one might expect that the behavior that is perceived as riskier will be more sensitive to the overall prevalence. In contrast, conducts that are not perceived as highly hazardous are not likely to invite such a strong reaction even if they are not so common. This suggests that the link between prevalence and marriage gap will depend on the type of behavior and its perceived risks.

Smoking, binge drinking, unhealthy diet and physical inactivity

This paper focuses on four types of health-related practices: smoking, binge drinking, physical inactivity, and vegetable and fruit intake. Albeit the importance of all of these behaviors for health is generally accepted they may not pose the same health-risk or may not be perceived as equally health-compromising by general population. Smoking is probably the

most objectionable behavior and has arguably already achieved a stigmatized status (Stuber, Galea and Link 2008). Even though some differences across individual societies still exist the anti-tobacco sentiment and anti-tobacco campaigns are growing in most countries (Joossens and Raw 2006). Excessive alcohol consumption also attracts strong social condemnation but there are significant cultural differences in what is considered to be excessive and even heavy drinking might be socially acceptable in certain situations (Schomerus et al. 2011). In contrast, physical inactivity and unhealthy diet are likely to provoke much less social disapproval and the link between these behaviors and social stigmatization is rather indirect through their association with obesity. Not following healthy diet or the preference for hearty meals might be even perceived positively as an expression of real masculinity (Gough 2007). Similarly, too vigorous physical activity is sometimes viewed as inappropriate for women corrupting their real femininity (Rook, Thuras and Lewis 1990).

The premise that smoking is the most and physical inactivity/unhealthy diet the least socially stigmatized health behaviors has two implications for the lifestyle between the married and unmarried. First, conjugal social control is likely to be strongest and the difference between married and unmarried the largest in case of the former and the weakest in case of the latter. Second, the marriage gap in smoking and drinking should be more sensitive to the prevalence of these behaviors in the society. A little empirical work was done to test the second prediction. However, findings from past studies seem to be congruent with the first expectation. The existing research demonstrates a consistent negative link between being married and smoking, mixed and context-dependent link between marital status and alcohol consumption and inconclusive results with regards to the healthy diet and physical activity.

For example, there is evidence that married individuals are less likely to smoke and more likely to quit smoking in Sweden (Nystedt 2006), Denmark (Osler et al. 1999), the United States (Kalman et al. 2010; Prady et al. 2012), Finland (Broms et al. 2004) and Korea

(Cho et al. 2008). The negative link between marriage and alcohol intake is consistently reported in the United States or United Kingdom (Collins, Ellickson and Klein 2007; Duncan, Wilkerson and England 2006; Chilcoat and Breslau 1996; Ryan 2010; Staff et al. 2010). In contrast, some studies from Asia or France did not observe any association between the marital status and drinking or reported a positive link (Park, Kim and Jhun 2008; Saito et al. 2005; Zins et al. 2003). With regards to the eating habits, some works found that married men and women are more likely to exercise and eat more vegetables and fruits, nuts and poultry and less fast food (Dibsdall et al. 2003; Pettee et al. 2006; Satariano, Haight and Tager 2002; Yannakoulia et al. 2008). At the same time, other studies report higher physical activity among divorcees (Contoyannis and Jones 2004; Lee et al. 2004; Qi, Phillips and Hopman 2006) and still others did not find any significant differences among married and unmarried individuals in exercising or dietary patterns (Guo et al. 2004; Leis et al. 2010). In fact, obesity is the only domain in which married men and women display systematically worse results than the never married, divorced and widowed (Eng et al. 2005; Jeffery and Rick 2002; Meltzer et al. 2013).

Gender, marital roles, and health behaviors

Any study on the link between the marital status and health must consider gender differences. Past research demonstrates that marriage provides benefits for both sexes but females are usually more successful in influencing their male partners' health behaviors (Westmaas, Wild and Ferrence 2002). Several theories were proposed to explain this observation. First, women generally possess more knowledge about health-related issues and monitor their own health status more closely than men. Their traditional nurturing role encourage them not only to guard their own health but also to monitor their spouses' health and assume responsibility for their partners' behavior (Umberson 1992). Indeed, married men report to have their behavior

monitored more often than married women (August and Sorkin 2010). At the same time, women display stronger tendency to avoid risky behaviors and some of the risk aversion might spill-over to their male partners.

Second, women seem to be more efficient in their ability to influence partners' health habits. One of the possible explanations for this finding is that women's social control efforts tend to incorporate more empathy and emotional support. The ability to express sympathy and understanding might result in greater success in helping their spouses' to quit unhealthy habits or to stick to the healthy routine. Furthermore, men's attempts to control and influence unhealthy habits of their female partners might be viewed as inconsistent with their masculinity and might produce negative reactions in their female partners (Westmaas, Wild and Ferrence 2002).

Based on these gender differences, one might expect that the men's health habits will be more sensitive to their marital status. It is however not clear whether these differences between men and women affect the prevalence – marriage gap link. This paper however re-estimated all models also for the male and female subsamples.

Hypotheses

Based on the theoretical arguments reviewed above, three hypotheses were formulated.

- Hypothesis 1: The effect of marital status (and associated social control) is mediated by the acceptance of the behavior in the broader social environment. Thus, the link between marital status and health-related behavior is weaker if the behavior is more prevalent in the society.
- Hypothesis 2: The levels of prevalence of the given behavior plays more prominent role in case of negative behaviors such as smoking and drinking than in case of the relatively benign conducts such as physical inactivity and unhealthy diet.

Data and method

The paper uses the ISSP 2011 data from 26 countries (Australia, Belgium, Bulgaria, Chile, Croatia, the Czech Republic, Finland, France, Germany, Israel, Japan, Korea, Lithuania, the Netherlands, Norway, Philippines, Poland, Portugal, Russia, Slovakia, Slovenia, South Africa, Sweden, Switzerland, Turkey, and the United States). Taiwan is dropped from the analysis due to the more than 50 % missing values in some of the life-style variables. The data from the United Kingdom and Denmark are not used as they do not distinguish married and unmarried couples. In total, information on 33,917 respondents is analyzed.

Dependent variables: Life-style measures

The ISSP data include four questions on health-related behaviors: smoking, binge drinking, physical activity, and fresh vegetable and fruit intake. Smoking was recorded on a 7-point scale from "do not smoke and never did" to "smoke more than 40 cigarettes per day". Other practices were measured using a 5-point scale (never, once a month or less often, several times a month, several times a week, daily). The binge drinking is defined as drinking 4 or more alcoholic drinks on the same day, the physical activity refers to doing something that makes one sweat or breathe more heavily than usual for at least at least 20 minutes. Healthy diet refers to eating fresh fruit or vegetables without any further specification. Using these questions, the binary measures of smoking, binge drinking, physical inactivity, and unhealthy diet were constructed.

Smoking distinguishes those who currently smoke (1) versus all current non-smokers (0). Those who smoked in the past but quitted are included among non-smokers.

Binge drinkers are defined as those who have four or more drinks on the same day at least several times a month (coded as 1, all others coded as 0). This coding follows the

prevalent practice that differentiates between those who engage in such behavior at least once a month and the less frequent drinkers (Miller et al. 2007; Naimi et al. 2013; Pajak et al. 2013; Zeigler et al. 2005).

Respondents who report the vigorous physical activity several times a week are considered as active (coded as 0) whereas all others are classified among *physically inactive* (coded as 1; similarly also De Vries et al. 2008; Reeves and Rafferty 2005; Schuit et al. 2002).

The measure of *unhealthy diet* is coded 1 if respondent does not eat fresh fruit and vegetables daily, otherwise 0. It must be noted that this measure is less strict than it is usual in the epidemiological studies but the data do not offer more detailed information that would allow taking into account the size of servings (Berrigan et al. 2003; De Vries et al. 2008).

Control and explanatory variables

The main explanatory variable distinguishes those who are currently married and live with their spouse and those who are single. Cohabitors were dropped from the current study for two reasons. First, the number of cohabitors in some of the country samples is very low. Second, there are substantive reasons not to incorporate cohabitors into the married category. Whereas the evidence that marriage enhances health and well-being is consistent the role of cohabitation is not clear. On one hand, one might speculate that cohabitation offers some of the benefits of marriage and co-residence with an intimate partner implies some degree of social control irrespective of the legal marital status. On other hand, cohabitation is not fully institutionalized and prescribed behaviors for cohabitors are not as well defined as for married couples (Gray and Evans 2008). This might imply that the role of unmarried partner might not be associated with the same degree of behavioral constraints as the role of a spouse. Moreover, cohabitors might be less willing to let their partners monitor and control their

behavior. Indeed, a growing empirical literature from the United States and Europe demonstrates that cohabitation is associated with heightened risk of heavy drinking and drug use despite its resemblance to marriage (Caetano et al. 2006; Joutsenniemi et al. 2007; Li et al. 2010; Plant et al. 2008).

Other covariates include sex (male = 1), age (continuous), education in years (continuous; categorical measures tested but not used in the reported models), employment status (non-working – 0 hours, working < 40 hours a week, working 40+ hours), and a presence of a minor child in the household (at least 1 minor child = 1, otherwise 0). The prevalence of the behavior in the given society is expressed by the proportion of those who participate in the given activity. Specifically, the measure is calculated as the proportion of respondents with the value of 1 in the binary responses for smoking, binge drinking, not exercising, and not eating vegetables and fruit daily.

Method

A set of multilevel mixed-effects logistic regressions was estimated with the dependent variables smoking, binge drinking, physical inactivity, and insufficient vegetable and fruit intake (Stata 13 - xtmelogit). These models treat respondents as nested within the countries and account for the inter-dependence between the observations. All reported models use the covariance structure independent, i.e. all the covariances between random effects are assumed to be zero and are not estimated. To test the plausibility of this assumption, the same models were re-estimated allowing all covariances to differ from 0 (unstructured covariance). As the likelihood-ratio test does not indicate significant differences between these models, the more parsimonious model with independent covariance structure is used.

The data are not weighted as no standardized weights for all countries are available. Some countries do not provide any weights and there is no standardized calculation of weights even for countries who submitted their weights.

All analyses include respondent's sex as a control variable. Moreover, the models were also estimated separately for the male and female sub-sample. The estimates using the male and female subsamples are discussed if they deviated from the overall picture.

Results

Descriptive statistics

Table 1 reports descriptive statistics. The mean age of respondents was 49.2 years and 55.6 % of respondents were women; the higher sex ration was observed in Russia and Chile with over 60 % of respondents being women. In total, 55.5 % of the sample was married at the time of the survey. The highest proportion of married individuals was found in Turkey, Philippines, Korea, and Australia whereas the South Africans, Chileans, Americans, and Russian were the least likely to be married. Respondents had on average 12.1 years of schooling, lower average level of education was observed in Philippines, Portugal, and Turkey.

As for the life-style characteristics, binge drinking is the most common in Korea, the Netherlands, Japan and Belgium whereas less than 10 % of Israelis, Bulgarians, Portuguese and Turks reported drinking more than 4 drinks in one day on a regular basis. Bulgarians, Croatians and Czechs are however the most likely to smoke. In contrast, smoking is rare especially in Australia where only 1 respondent out of 10 admitted being a smoker. The ISSP data also suggest that Japan belongs not only among countries with the highest prevalence of binge drinking but also that the Japanese (along with South Africans, Turks and Russians) are the least likely to participate in any physical activity (only 21 % of Japanese exercise regularly). Physical activity is however rather common in Norway, Switzerland, and the

United States. As for the dietary patterns, the lowest vegetable and fruit consumption is reported by South Africans, Russians and Koreans and highest among Australians, the Dutch, and Portuguese.

INSERT TABLE 1 and 2

Table 3 provides an overview of the four types of health-related behavior by marital status. Given the lack of weights in some countries the un-weighted percentages are reported. These descriptive statistics suggest that married individuals are less likely to smoke than singles in 17 countries out of 26, no difference (less than 1 percentage point) was found in 2 other countries[1]. Smoking is more common among married individuals only in some Central and Eastern European countries (Bulgaria, Czech Republic, Lithuania, Russia, and Slovakia)[2] and South Africa but the difference is small even in these countries. In general, singles are also more likely to binge drink. Thus, higher binge drinking among singles was found in 17 countries out of 26; the pattern is however reversed in Japan, Korea, Philippines, Australia, and partly in Russia (the difference of 3.9-6.4 percentage points). Married respondents also eat more fresh fruit and vegetables (all countries but Philippines). The link between physical activity and marital status is the weakest. The married individuals were more likely to exercise only in 11 out of 26 countries[3].

INSERT TABLE 3

[1] When available weights were used the singles were more likely to smoke in 19 countries and there was no difference in four countries.
[2] For the Czech Republic, Lithuania, and Slovakia, it holds only in the un-weighted sample.
[3] The advantages of the married individuals increases when weights were applied and they were exercising with higher frequency in 17 countries out of 26.

Multilevel model - results

Table 4 shows the estimated coefficients from the multilevel mixed effect regressions for two models. The first model serves as a baseline and includes all control and explanatory variables at the individual and country level. The second model enters the cross-level interactions between the marital status and prevalence of the analyzed behavior. The significance of the interaction effect is tested by the likelihood-ratio test and the BIC – Bayesian information criterion (Raftery 1995). It is necessary to note that the likelihood-ratio test is highly sensitive in large samples while BIC penalizes models with more parameters.

The hypothesis 1 predicted that the association between the marital status and a health behavior is mediated by the prevalence of this behavior in broader social networks. Table 4 only partly confirms this expectation. The interaction term between physical inactivity and the general level of inactivity in the country is clearly not significant neither from the BIC, nor likelihood ratio test. However, the fit statistics (likelihood ratio test and BIC) show that the interaction effects are positive and significant in case of smoking and binge drinking. The Bayesian information criterion – that is generally the preferred measure of fit if the sample size is large – decreased by 9 and 18 points respectively. The similar trend is observed for insufficient vegetable and fruit intake but the picture is less clear. Even though the likelihood ratio test suggests that the interaction term between marital status and the general vegetable consumption in the society is significant there is no change in BIC. Given the high sensitivity of likelihood ratio test in large samples one can conclude that the analysis does not provide clear evidence that the interaction term is significant. Figure 1 slo indicates that the marriage gap in vegetable and fruit intake is closing but relatively slowly. This indicates that married individuals keep their advantage with respect to healthy diet (measured by fruit and vegetable consumption) in all these societies. One must note that no major gender differences were revealed in this case.

The hypothesis 2 suggested that the effect of the prevalence and acceptability of the behavior is more important in case of high-risk behaviors such as smoking and drinking than is in case of physical inactivity and unhealthy diet. Table 4 clearly supports this prediction in two ways. First, the fit statistics indicate that the interactions terms do no improve the model much in case of physical inactivity and unhealthy diet. In contrast, the interaction clearly reached statistical significance in case of smoking and excessive alcohol intake. Second, the sizes of the coefficients are also larger for the latter behaviors, which suggests that the marriage gap is stronger for smoking and binge drinking. However, a closer inspection of the data reveals that the situation is more complicated in case of binge drinking (see Figure 1). It seems that with the increasing levels of binge drinking the gap between the married and unmarried is indeed declining but the trend is reversed in societies with the highest levels of excessive alcohol intake. This effect is driven by Japan and Korea – in their case, being married increases tendency towards binge-drinking but the same does not hold for the other binge-drinking societies such as the Netherlands. It must be noted that high levels of binge drinking among married men in Japan was demonstrated also by other studies (Saito et al. 2005). Furthermore, Figure 1 corroborates the second hypothesis that the marital status will be much less sensitive to the prevalence of the activity in case of physical inactivity and unhealthy diet.

INSERT TABLE 4

INSERT FIGURE 1

The analyses generally support the hypotheses that the association between marital status and health behavior is mediated by the acceptance/prevalence of the behavior in the society. The previous analysis however neglected to consider potential gender differences. The estimated

trends were similar in both male and female sub-samples in case of physical inactivity and vegetable and fruit consumption[4]. However, the separate analyses for men and women indicate important gender differences in case of smoking and binge drinking. It seems that the effect of declining association between marital status and smoking with the increasing prevalence of tobacco consumption in the country is driven predominantly by women. In other words, it is the married women who catch up with their single counterparts if smoking is very common. In contrast, the narrowing gap of binge drinking between married and unmarried individuals in societies with higher alcohol intake is driven predominantly by men. Thus, it is the married men who catch up with their single counterparts if binge drinking is common in the society.

Conclusions

The paper tested the question of whether the association between the marital status and health-related behaviors depend on the prevalence of the behavior in the society. Two hypotheses were formulated to explore the research question. The first hypothesis predicted that the link between marital status and given behavior will be weaker if the behavior is more prevalent. The second hypothesis predicted that the described effect will be stronger in case of negative behaviors linked with stigmatization that with positive behaviors linked with social approval. Both of these hypotheses were tested using the ISSP 2011 dataset.

The analysis confirmed both predictions. The finding that the more common the behavior is the smaller is the gap between the married and unmarried population holds for smoking and binge drinking (except for the two Asian societies included in the sample) and to some degree for the fresh vegetable consumption. The analysis however also shows that the effect is observable mainly for the negative behaviors such as smoking and drinking. As for

[4] It was impossible to estimate the model for female sub-sample if both marital status and parental status were in the same model. A model that did not control for the presence of a child in the household was estimated instead.

the pro-active health behaviors such as exercising and healthy eating, the mediating effect of the prevalence was not confirmed or was very weak.

REFERENCES:

August, Kristin J., and Dara H. Sorkin. 2010. "Marital status and gender differences in managing a chronic illness: The function of health-related social control." *Social Science and Medicine* 71:1831-38.

Berrigan, David, Kevin Dodd, Richard P. Troiano, Susan M. Krebs-Smith, and Rachel Ballard Barbash. 2003. "Patterns of health behavior in US adults." *Preventive Medicine* 36(5):615-23.

Broms, Ulla, Karri Silventoinen, Eero Lahelma, Markku Koskenvuo, and Jaakko Kaprio. 2004. "Smoking cessation by socioeconomic status and marital status: The contribution of smoking behavior and family background." *Nicotine & Tobacco Research* 6(3):447-55.

Caetano, Raul, Suhasini Ramisetty-Mikler, Louise R Floyd, and Christine McGrath. 2006. "The epidemiology of drinking among women of childbearing age." *Alcoholism: Clinical and Experimental Research* 30(6):1023-30.

Collins, Rebecca L., Phyllis L. Ellickson, and David J. Klein. 2007. "The role of substance use in young adult divorce." *Addiction* 102(5):786-94.

Colman, Elien, Sarah Missinne, and Piet Bracke. 2013. "Mental health care use among recently cohabiting and newlywed couples: An application of the social control theory." *Social Work in Mental Health* 12(2):132-54.

Contoyannis, Paul, and Andrew M. Jones. 2004. "Socio-Economic status, health and lifestyle." *Journal of Health Economics* 23(5):965-95.

De Vries, Hein, Jonathan van't Riet, Mark Spigt, Job Metsemakers, Marjan van den Akker, Jeroen K Vermunt, and Stef Kremers. 2008. "Clusters of lifestyle behaviors: Results from the Dutch SMILE study." *Preventive Medicine* 46(3):203-08.

Dibsdall, L.A., N. Lambert, R.F. Bobbin, and L.J. Frewer. 2003. "Low-income consumers' attitudes and behaviour towards access, availability and motivation to eat fruit and vegetables." *Public Health Nutrition* 6(2):159-68.

Duncan, Greg, Bessie Wilkerson, and Paula England. 2006. "Cleaning up their act: The effects of marriage and cohabitation on licit and illicit drug use." *Demography* 43(4):691-710.

Dupre, Matthew E., Audrey N. Beck, and Sarah O. Meadows. 2009. "Marital trajectories and mortality among US adults." *American Journal of Epidemiology* 170(5):546-55.

Eikemo, Terje A., and J. Mackenbach. 2012. *The potential for reducing health inequalities in Europe. EURO-GBD-SE Final Report*. Rotterdam: Department of Public Health, University Medical Centre Rotterdam.

Eng, Patricia Mona, Ichiro Kawachi, Garrett Fitzmaurice, and Eric B Rimm. 2005. "Effects of marital transitions on changes in dietary and other health behaviours in US male health professionals." *Journal of Epidemiology and Community Health* 59(1):56-62.

Gough, Brendan. 2007. "'Real men don't diet': An analysis of contemporary newspaper representations of men, food and health." *Social Science & Medicine* 64(2):326-37.

Gray, Edith, and Ann Evans. 2008. "Do couples share income." *Australian Journal of Social Issues* 43(3).

Guo, Xuguang, Beverly A. Warden, Sahasporn Paeratakul, and George A. Bray. 2004. "Healthy eating index and obesity." *European journal of clinical nutrition* 58(12):1580-86.

Holt-Lunstad, Julianne, Wendy Birmingham, and Brandon Q. Jones. 2008. "Is there something unique about marriage? The relative impact of marital status, relationship quality, and network social support on ambulatory blood pressure and mental health." *Annals of Behavioral Medicine* 35(2):239-44.

Chilcoat, Howard D, and Naomi Breslau. 1996. "Alcohol disorders in young adulthood: Effects of transitions into adult roles." *Journal of Health and Social Behavior*:339-49.

Cho, Hong-Jun, Young-Ho Khang, Hee-Jin Jun, and Ichiro Kawachi. 2008. "Marital status and smoking in Korea: The influence of gender and age." *Social Science & Medicine* 66(3):609-19.

Jeffery, Robert W., and Allison M. Rick. 2002. "Cross-sectional and longitudinal associations between Body Mass Index and marriage-related factors." *Obesity Research* 10(8):809-15.

Joossens, Luk, and Martin Raw. 2006. "The tobacco control scale: A new scale to measure country activity." *Tobacco control* 15(3):247-53.

Joutsenniemi, Kaisla, Tuija Martelin, Laura Kestilä, Pekka Martikainen, Sami Pirkola, and Seppo Koskinen. 2007. "Living arrangements, heavy drinking and alcohol dependence." *Alcohol and Alcoholism* 42(5):480-91.

Kalman, David, Randall Hoskinson, Usha Sambamoorthi, and Arthur J. Garvey. 2010. "A Prospective Study of Persistence in the Prediction of Smoking Cessation Outcome: Results from a Randomized Clinical Trial." *Addictive Behaviors* 35(2):179-82.

Koskinen, Seppo, Kaisla Joutsenniemi, Tuija Martelin, and Pekka Martikainen. 2007. "Mortality Differences according to Living Arrangements." *International Journal of Epidemiology* 36:1255-64.

Kposowa, Augustine J. 2000. "Marital status and suicide in the National Longitudinal Mortality Study." *Journal of Epidemiology and Community Health* 54(4):254-61.

Lee, Sunmin, Eunyoung Cho, Francine Grodstein, Ichiro Kawachi, Frank B. Hu, and Graham A. Colditz. 2004. "Effects of Marital Transitions on Changes in Dietary and Other Health Behaviours in US Women." *International Journal of Epidemiology* 34:69-78.

Leis, Karen S., Bruce A. Reeder, Karen E. Chad, Kevin S. Spink, Koren L. Fisher, and Brenda G. Bruner. 2010. "The Relationship of Chronic Disease and Demographic Variables to Physical Activity in a Sample of Women Aged 65 to 79 Years." *Women & Health* 50(5):459-74.

Lewis, Megan A., and Rita M. Butterfield. 2007. "Social control in marital relationships: Effect of one's partner on health behaviors." *Journal of Applied Social Psychology* 37(2):298-319.

Lewis, Megan A., Colleen M. McBride, Kathryn I. Pollak, Elaine Puleo, Rita M. Butterfield, and Karen M. Emmons. 2006. "Understanding health behavior change among couples: An interdependence and communal coping approach." *Social Science & Medicine* 62(6):1369-80.

Li, Qing, Richard Wilsnack, Sharon Wilsnack, and Arlinda Kristjanson. 2010. "Cohabitation, gender, and alcohol consumption in 19 Countries: a multilevel analysis." *Substance use & misuse* 45(14):2481-502.

Liu, Hui, and Debra J. Umberson. 2008. "The Times They Are a Changin': Marital Status and Health Differentials from 1972 to 2003." *Journal of Health & Social Behavior* 49(3):239-53.

Masocco, Maria, Maurizio Pompili, Monica Vichi, Nicola Vanacore, David Lester, and Roberto Tatarelli. 2008. "Suicide and Marital Status in Italy." *Psychiatric quarterly* 79(4):275-85.

Meltzer, Andrea L, Sarah A Novak, James K McNulty, Emily A Butler, and Benjamin R Karney. 2013. "Marital Satisfaction Predicts Weight Gain in Early Marriage." *Health Psychology* 32:824-27.

Miller, Jacqueline W, Timothy S Naimi, Robert D Brewer, and Sherry Everett Jones. 2007. "Binge drinking and associated health risk behaviors among high school students." *Pediatrics* 119(1):76-85.

Murphy, Michael, Emily Grundy, and Stamatis Kalogirou. 2007. "The Increase in Marital Status Differences in Mortality up to the Oldest Age in Seven European countries, 1990-99." *Population Studies* 61(3):287-98.

Naimi, Timothy S., Ziming Xuan, David W. Brown, and Richard Saitz. 2013. "Confounding and studies of 'moderate' alcohol consumption: the case of drinking frequency and implications for low-risk drinking guidelines." *Addiction* 108(9):1534-43.

Nystedt, Paul. 2006. "Marital Life Course Events and Smoking Behaviour in Sweden 1980–2000." *Social Science & Medicine* 62(6):1427-42.

Osler, Merete, Eva Prescott, Nina Godtfredsen, Hans Ole Hein, and Peter Schnohr. 1999. "Gender and Determinants of Smoking Cessation: A Longitudinal Study." *Preventive Medicine* 29(1):57-62.

Pajak, Andrzej, Krystyna Szafraniec, Ruzena Kubinova, Sofia Malyutina, Anne Peasey, Hynek Pikhart, Yuri Nikitin, Michael Marmot, and Martin Bobak. 2013. "Binge Drinking and Blood Pressure: Cross-Sectional Results of the HAPIEE Study." *PLoS ONE* 8(6):e65856.

Park, Jong-Tae, Byoung-Gwon Kim, and Hyung-Joon Jhun. 2008. "Alcohol consumption and the CAGE questionnaire in Korean adults: results from the Second Korea National Health and Nutrition Examination Survey." *Journal of Korean medical science* 23(2):199-206.

Pettee, Kelley K., Jennifer S. Brach, Andrea M. Kriska, Robert Boudreau, Caroline R. Richardson, Lisa H. Colbert, Suzanne Satterfield, Marjolein Visser, Tamara B. Harris, and Hilsa N. Ayonayon. 2006. "Influence of Marital Status on Physical Activity Levels Among Older Adults." *Medicine and science in sports and exercise* 38(3):541-46.

Plant, Moira, Patrick Miller, Martin Plant, Sandra Kuntsche, Gerhard Gmel, with S Ahlström, Allaman Allamani, Francois Beck, Karin Bergmark, and Kim Bloomfield. 2008. "Marriage, cohabitation and alcohol consumption in young adults: an international exploration." *Journal of Substance Use* 13(2):83-98.

Prady, StephanieL, Kathleen Kiernan, Karen Bloor, and KateE Pickett. 2012. "Do Risk Factors for Post-partum Smoking Relapse Vary According to Marital Status?" *Maternal and Child Health Journal* 16(7):1364-73.

Qi, Vikky, Susan P Phillips, and Wilma M Hopman. 2006. "Determinants of a Healthy Lifestyle and Use of Preventive Screening in Canada." *BMC Public Health* 6(1):275.

Raftery, Adrian. 1995. "Bayesian Model Selection in Social Research." *Sociological Methodology* 25:111-63.

Reeves, Mathew J, and Ann P Rafferty. 2005. "Healthy lifestyle characteristics among adults in the United States, 2000." *Archives of Internal Medicine* 165(8):854.

Rook, Karen S, Paul D Thuras, and Megan A Lewis. 1990. "Social control, health risk taking, and psychological distress among the elderly." *Psychology and Aging* 5(3):327-34.

Ryan, Andrea Kay. 2010. "Gender Differences in Family Formation Behavior: The Effects of Adolescent Substance Use." *Journal of studies on alcohol and drugs* 71(6):938.

Saito, Isao, Tomonori Okamura, Shunichi Fukuhara, Taichiro Tanaka, Yoshimi Suzukamo, Akira Okayama, and Hirotsugu Ueshima. 2005. "A cross-sectional study of alcohol drinking and health-related quality of life among male workers in Japan." *Journal of occupational health* 47(6):496-503.

Satariano, William A, Thaddeus J Haight, and Ira B Tager. 2002. "Living Arrangements and Participation in Leisure-Time Physical Activities in an Older Population." *Journal of Aging and Health* 14(4):427-51.

Schomerus, Georg, Michael Lucht, Anita Holzinger, Herbert Matschinger, Mauro G Carta, and Matthias C Angermeyer. 2011. "The stigma of alcohol dependence compared with

other mental disorders: a review of population studies." *Alcohol and Alcoholism* 46(2):105-12.

Schuit, A. Jantine, A. Jeanne M. van Loon, Marja Tijhuis, and Marga C. Ocké. 2002. "Clustering of Lifestyle Risk Factors in a General Adult Population." *Preventive Medicine* 35(3):219-24.

Staff, Jeremy, John E. Schulenberg, Julie Maslowsky, Jerald G. Bachman, Patrick M. O'Malley, Jennifer L. Maggs, and Lloyd D. Johnston. 2010. "Substance Use Changes and Social Role Transitions: Proximal Developmental Effects on Ongoing Trajectories from Late Adolescence Through Early Adulthood." *Development and Psychopathology* 22(Special Issue 04):917-32.

Stuber, Jennifer, Sandro Galea, and Bruce G Link. 2008. "Smoking and the emergence of a stigmatized social status." *Social Science & Medicine* 67(3):420-30.

Umberson, Debra. 1987. "Family Status and Health Behaviors: Social Control as a Dimension of Social Integration." *Journal of Health and Social Behavior* 28:306-19.

—. 1992. "Gender, Marital Status and the Social Control of Health Behavior." *Social Science & Medicine* 34(8):907-17.

Waite, Linda J. 1995. "Does Marriage Matter?" *Demography* 32(4):483-507.

Westmaas, J. Lee, T. Cameron Wild, and Roberta Ferrence. 2002. "Effects of gender in social control of smoking cessation." *Health Psychology* 21(4):368.

Yannakoulia, M., D. Panagiotakos, C. Pitsavos, Y. Skoumas, and C. Stafanadis. 2008. "Eating patterns may mediate the association between marital status, body mass index, and blood cholesterol levels in apparently healthy men and women from the ATTICA study." *Social science & medicine (1982)* 66(11):2230-39.

Zeigler, Donald W, Claire C Wang, Richard A Yoast, Barry D Dickinson, Mary Anne McCaffree, Carolyn B Robinowitz, and Melvyn L Sterling. 2005. "The neurocognitive effects of alcohol on adolescents and college students." *Preventive Medicine* 40(1):23-32.

Zins, Marie, Alice Gueguen, Annette Leclerc, and Marcel Goldberg. 2003. "Alcohol consumption and marital status of French women in the GAZEL cohort: a longitudinal analysis between 1992 and 1996." *Journal of studies on alcohol and drugs* 64(6):784.

Descriptive statistics (% and means)

	All				Only married and single			
	Single	Married	Cohabitors		Economic activity, comp. 1-40 hours, %		Mean	
	%	%	%	Men %	None	40+ hours	Age	Education (yrs)
Australia	26.6	65.6	7.9	47.1	46.1	18.2	55.8	13.5
Bulgaria	37.9	53.5	8.6	42.7	57.9	14.1	53.6	11.6
Chile	47.9	42.8	9.4	39.2	53.8	34.6	47.2	10.6
Croatia	45.0	52.3	2.6	47.4	51.3	14.6	45.8	12.0
Czech R.	34.2	57.9	7.8	45.4	43.6	33.3	48.1	12.8
Finland	36.5	49.1	14.4	44.3	46.3	12.9	47.5	13.3
France	30.3	54.3	15.4	42.1	51.8	10.9	54.2	13.5
Israel	33.9	63.2	2.9	43.9	39.5	26.7	46.0	13.0
Japan	34.3	65.0	0.7	47.3	40.4	29.0	50.6	12.6
Korea	33.0	66.4	0.5	44.9	41.7	35.7	46.1	12.3
Norway	28.2	54.0	17.8	46.9	31.7	25.2	50.3	13.4
Phillip	22.8	67.8	9.4	50.6	45.0	33.1	43.8	8.8
Russia	49.8	45.5	4.7	34.7	53.3	15.7	48.7	12.3
Slovenia	34.4	52.1	13.4	45.5	52.8	15.9	50.5	12.3
Switzerland	33.5	57.6	8.9	51.1	38.7	36.0	49.6	13.0
Belgium	32.9	52.2	14.9	45.8	55.0	10.9	50.9	12.8
Germany	34.0	55.5	10.5	49.4	46.0	17.7	50.7	12.4
Lithuania	48.4	49.3	2.3	41.6	52.9	15.6	48.0	12.6
Netherlands	33.2	54.2	12.6	45.2	53.5	6.7	55.5	13.4
Poland	37.0	58.7	4.3	46.0	47.7	22.7	48.3	12.5
Portugal	32.3	60.5	7.1	41.3	52.5	19.0	52.2	9.3
Slovakia	34.9	61.4	3.7	47.2	49.3	26.1	52.4	13.2
South Africa	56.7	37.5	5.7	41.4	69.1	16.3	40.9	10.2
Sweden	33.1	49.0	18.0	48.4	45.5	14.3	51.5	12.3
Turkey	24.5	73.7	1.8	40.2	76.5	15.1	42.2	7.2
USA	45.8	45.3	9.0	43.6	42.2	23.1	50.9	13.7

Source: ISSP 2011

Table 2: Life style behaviors by sex (%), married and single only (cohabitors dropped)

	Smoking			Binge drinking			Physical inactivity			No vegetables		
	M	**W**	**Total**	**M**	**W**	**Total**	**M**	**W**	**Total**	**M**	**W**	**Total**
Australia	12.0	8.1	9.9	33.3	15.7	24.0	44.9	47.7	46.5	36.8	24.2	30.0
Bulgaria	43.4	26.5	33.7	15.7	2.7	8.3	60.0	65.3	63.1	55.0	48.3	51.1
Chile	35.5	26.5	30.0	17.6	6.0	10.5	67.0	77.7	73.5	64.8	57.9	60.6
Croatia	41.1	36.5	38.7	26.2	10.6	18.0	64.8	76.8	71.1	71.0	62.6	66.6
Czech R.	43.5	23.3	32.4	32.5	10.0	20.2	59.6	64.4	62.2	74.8	57.4	65.2
Finland	21.5	20.0	20.6	36.3	14.1	24.0	53.3	50.6	51.8	60.6	34.6	46.3
France	21.3	20.2	20.7	28.6	8.5	16.9	50.1	62.0	57.0	45.6	36.1	40.1
Israel	33.2	19.8	25.7	14.7	5.4	9.5	57.4	67.7	63.2	48.1	42.1	44.7
Japan	33.0	11.9	21.8	40.1	15.5	27.2	75.0	82.3	78.9	67.9	48.0	57.4
Korea	41.6	3.7	20.7	56.2	17.7	35.0	56.5	61.4	59.2	75.5	62.6	68.4
Norway	17.2	19.7	18.5	29.4	13.2	20.8	44.0	37.2	40.4	58.9	33.3	45.2
Phillip	45.3	9.9	27.8	34.4	13.8	24.3	59.6	68.9	64.2	61.1	59.0	60.1
Russia	50.4	12.8	25.8	34.4	9.0	17.8	70.4	79.3	76.2	71.9	67.7	69.2
Slovenia	26.4	17.0	21.3	19.8	2.9	10.5	36.9	48.6	43.3	54.1	35.6	44.0
Switzerland	26.0	16.9	21.5	29.1	12.4	21.0	38.3	45.2	41.7	47.9	23.8	36.0
Belgium	20.1	17.0	18.4	36.0	17.2	25.8	56.9	67.8	62.8	48.9	28.9	38.2
Germany	28.8	26.1	27.4	27.6	10.7	19.1	42.8	52.0	47.4	57.5	37.1	47.4
Lithuania	45.4	14.0	27.0	38.0	11.9	22.7	56.4	66.2	62.2	71.7	58.7	64.1
Netherlands	18.8	17.5	18.1	39.2	18.6	27.9	43.3	43.3	43.3	40.1	21.1	29.6
Poland	31.1	18.4	24.2	39.5	9.6	23.3	58.4	65.7	62.4	67.8	50.7	58.5
Portugal	29.1	16.5	21.7	20.5	1.4	9.3	61.1	66.1	64.0	36.8	32.0	34.0
Slovakia	31.6	16.9	23.8	20.3	1.8	10.4	58.5	62.9	60.8	66.5	52.3	58.9
South Africa	29.9	11.8	19.3	28.1	10.1	17.5	72.6	82.6	78.5	74.8	74.5	74.6
Sweden	12.0	13.9	13.0	29.5	13.7	21.3	48.2	46.8	47.5	57.8	31.0	43.7
Turkey	45.8	17.7	29.0	10.0	3.3	6.0	74.2	78.5	76.8	64.0	65.4	64.8
USA	21.9	20.6	21.2	26.6	9.7	17.1	32.5	43.0	38.4	53.4	44.4	48.3

Source: ISSP 2011

Table 3: Life style behaviors by conjugal status (%)

	Smoking			Binge drinking			Physical inactivity			No vegetables		
	Single	Marriage	Cohabit	Single	Marriage	Cohabit	Single	Marriage	Cohabit	Single	Marriage	Cohabit
Australia	15.7	7.8	17.7	21.5	25.3	38.8	45.3	46.8	41.4	36.2	26.8	31.7
Bulgaria	31.6	35.1	61.6	9.6	7.1	7.0	64.8	61.7	62.8	55.2	45.5	67.4
Chile	32.5	27.0	43.1	12.3	8.5	8.3	72.4	75.4	74.3	62.6	56.9	69.9
Croatia	42.8	35.2	41.9	22.5	14.6	6.7	67.6	74.6	71.0	66.5	66.1	76.7
Czech R	29.7	33.6	41.2	24.1	17.7	31.6	59.6	64.2	60.3	66.0	64.6	67.6
Finland	27.8	15.1	29.5	24.0	24.1	24.9	53.3	50.6	53.3	52.9	37.3	60.0
France	28.1	17.1	31.9	18.9	16.7	17.2	55.2	57.6	60.7	44.6	35.4	46.3
Israel	33.2	21.8	40.0	15.4	6.3	22.9	62.0	63.9	50.0	50.5	41.5	48.6
Japan	21.5	22.0	< 20 r	23.0	29.4	< 20 r	78.8	79.3	< 20 r	68.8	51.0	< 20 r
Korea	24.3	18.9	< 20 r	32.3	36.3	< 20 r	60.4	58.6	< 20 r	73.4	65.9	< 20 r
Norway	23.0	16.2	18.7	26.6	18.2	26.8	41.9	40.0	40.6	52.1	39.6	51.1
Philippines	26.4	28.3	33.9	21.2	25.3	27.9	67.3	63.1	70.5	59.4	60.1	61.1
Russia	24.6	27.2	57.1	17.3	18.4	29.0	77.6	74.7	78.8	72.8	64.3	75.7
Slovenia	24.4	19.6	29.8	13.5	8.7	8.5	39.8	44.9	41.0	52.9	36.3	51.4
Switzerland	28.8	17.2	30.8	24.6	18.8	18.7	41.5	41.7	30.8	41.8	31.7	41.1
Belgium	23.3	15.2	26.0	27.1	25.4	29.9	60.6	63.9	57.6	44.9	32.5	41.1
Germany	36.4	22.0	45.1	22.3	17.0	18.3	46.1	48.2	37.8	54.7	42.0	52.0
Lithuania	26.1	27.6	40.7	21.4	23.3	25.9	63.8	60.1	57.7	67.9	59.9	81.5
Netherlands	25.1	14.0	17.2	29.2	27.3	32.0	46.1	41.8	40.7	33.1	27.1	31.7
Poland	24.4	24.2	60.4	23.3	23.2	37.5	57.5	65.4	54.2	62.5	55.1	70.8
Portugal	28.3	18.4	39.4	10.0	9.2	8.6	63.9	64.6	68.6	42.5	27.2	52.1
Slovakia	22.8	24.4	39.0	9.9	10.8	12.5	62.7	60.0	61.0	60.7	57.7	58.5
South Africa	18.4	20.0	31.1	19.0	15.2	35.0	80.7	75.8	75.8	78.0	71.0	75.6
Sweden	17.7	9.6	15.2	25.0	18.3	25.5	43.4	50.4	47.0	50.8	37.6	45.5
Turkey	35.7	26.9	39.3	10.3	4.6	7.1	74.4	77.7	78.6	65.2	65.0	57.1
USA	27.3	14.9	44.5	19.9	14.2	24.5	39.1	37.8	40.3	51.8	43.7	53.2

Source: ISSP 2011, < 20 r = less than 20 respondents in the country sample

Table 4: Estimates from the multilevel mixed effect logistic regression with dependent variable smoking, binge drinking, no exercising and no fresh vegetable intake

	Smoking		Drinking				No exercising		No fresh vegetable	
			All countries		W/o Japan, Korea					
	Model 2	Model 3	Model 2	Model 3	Model 2	Model 3	Model 2	Model 3	Model 2	Model 3
Married	-0.274 **	-0.776 **	-0.109 **	-0.634 **	-0.148 **	-0.531 **	-0.023	0.126	-0.374 **	-0.685 **
Age	-0.017 **	-0.017 **	-0.013 **	-0.013 **	-0.014 **	-0.014 **	0.007 **	0.007 **	-0.012 **	-0.012 **
Male	0.698 **	0.700 **	1.278 **	1.276 **	1.259 **	1.257 **	-0.295 **	-0.295 **	0.602 **	0.603 **
Children in hh	-0.046	-0.046	-0.320 **	-0.323 **	-0.345 **	-0.344 **	0.069 *	0.069 *	0.059 *	0.061 *
Education (years)	-0.039 **	-0.038 **	0.005	0.004	0.002	0.002	-0.032 **	-0.032 **	-0.059 **	-0.059 **
LF (comp. – 0 hrs)										
< 40 hours	0.368 **	0.367 **	0.253 **	0.252 **	0.207 **	0.207 **	0.059 *	0.060 *	0.032	0.030
40+ hours	0.453 **	0.454 **	0.307 **	0.306 **	0.256 **	0.256 **	0.031	0.032	0.091 **	0.089 **
Prevalence	0.055 **	0.044 **	0.072 **	0.058 **	0.076 **	0.065 **	0.042	0.043 **	0.039 **	0.036 **
Marriage*Preval.		0.020 **		0.025 **		0.019 **		-0.003		0.006 **
Constant	-1.665 **	-1.398 **	-2.994 **	-2.684 **	-2.946	-2.722	-0.1941	-2.026 **	-0.748 **	-0.560 **
BIC	34250.4	34241.9	29721.5	29703.6	26834.2	26833.5	42605.1	42613.8	42957.31	42957.02
Loglikehood	-17067.8	-17058.3	-14803.4	-14789.2	-13360.2	-13354.7	-21245.3	-21244.4	-21421.3	-21415.9
N =	33,917		33,801		31,210		33,442		33,892	

Source: ISSP 2011