Social Roles, Blood Pressure, and Health in a Nationally Representative Sample of Young Adults

Authors: Laura Chyu[1], Leah D. Doane Sampey[2], Emma K. Adam[1,3], Thomas W. McDade[1,4]

[1]Northwestern University Cells to Society (C2S): The Center on Social Disparities and Health at the Institute for Policy Research; [2]Arizona State University Department of Psychology; [3]Northwestern University School of Education and Social Policy Program in Human Development and Social Policy; [4]Northwestern University Department of Anthropology

BACKGROUND

The transition to adulthood is an important life stage during which individuals take on increasing responsibilities and roles in various social realms. The ways in which individuals combine and manage marriage, parenthood, work, and school may have important implications for stress and health. A major theoretical orientation is the role enhancement perspective, which posits that multiple roles increase an individual's power, resources, sense of social integration, and self-worth, which in turn enhance physical and mental well-being (Barnett & Baruch, 1985; Thoits 1983). Alternatively, the role strain perspective focuses on limitations of time and energy, competing role demands, and role overload, which are thought to be stressful and have deleterious effects on health (Goode, 1960). Other researchers have emphasized role context, such as certain role combinations (Thoits, 1992; Menaghan, 1989), role satisfaction (Coverman, 1989), and role quality (Barnett and Hyde, 2001), which can positively and/or negatively impact health. The concept of multiple roles is particularly pertinent to women, for whom increased labor force participation in the past few decades has significantly expanded women's roles beyond marriage and motherhood.

Prior research on multiple roles and health has primarily focused on self-reported, subjective health outcomes, however few studies have examined impact on physical health measures. In this study, blood pressure is examined as a health outcome because it has been found to be influenced by chronic stress and is a major risk factor for cardiovascular disease (Matthews et al., 1987; Schnall et al., 1992; Vrijkotte, van Doornen, & de Geus, 2000). We also examine the association between social roles and self-reported health to compare patterns of objective vs. subjective health measures in relation to social roles.

DATA & METHODS

Data description. This study uses data from the National Longitudinal Study of Adolescent Health (Add Health), a longitudinal study of a nationally representative sample of adolescents in grades 7-12 in the U.S. during the 1994-95 school year. The cohort has been followed into young adulthood with a total of four in-home interviews - Wave II in 1996, Wave III in 2001-2002, and the most recent Wave IV in 2007-2008, when the sample was aged 24-32 years. Add Health is a multi-respondent study, collecting data from respondents themselves, as well as their parents, friends, and school administrators (Bearman, Jones, & Udry, 1997). A school-based design was used to select a stratified sample of 80 high schools. The school student rosters constituted the student-level sampling frame. In Wave IV, in-home questionnaires were immediately followed by physical measurements and collection of biological specimens from respondents. The analytical sample for this study includes respondents includes respondents who participated in all four waves, were not in prison at Wave IV, and were not currently on active military duty in Wave IV.

Outcome variables. Blood pressure and hypertension were based on measurements from Wave IV. The field interviewer administered three consecutive readings of systolic and diastolic blood pressure and pulse rate at 30-second intervals using a Microlife BP3MC1-PC-IB oscillometric blood pressure monitor. Average systolic and diastolic blood pressure and pulse rate measures were constructed by Add Health from the second and third measures. When either the second or third measure was

missing, the other single measure was used. When both second and third measures were missing, the first measure was used (Entzel et al. 2009). Respondents with systolic blood pressure >140 mm Hg and diastolic blood pressure >90 mm Hg were categorized as hypertensive (Chobanian et al. 2003, Entzel et al. 2009). For self-reported health in Wave IV, respondent were asked, "In general, how is your health?" and response choices were excellent; very good; good; fair; poor. A dichotomous variable indicating fair or poor health was created.

Independent variables. The main explanatory variables in this study were measures of social roles at Wave IV – individual social roles; role occupancy; role strain; and role satisfaction. ***Individual social roles*** were coded as dichotomous variables and included employed (working 10 or more hours per week); married/cohabiting (living with spouse, boyfriend, or girlfriend in household); parent (has at least one biological, step, or adopted child); student (currently attending school); religious participation (attended church, synagogue, temple, mosque, or religious services in past year; or taken part in religious activities outside of regular worship services, such as classes, retreats, small groups, or choir in the past year); and community service/volunteer (performed any community service or volunteer work in the past year).

Role occupancy was operationalized as the sum of all individual roles, ranging from 0 to 6. In multivariate analyses, categories were collapsed to <1 role; 2 roles; 3 roles; 4 roles; and 5-6 roles. For employed individuals only, measures of *role strain* between work and family were created from the following questions: "In the past 12 months since you started your current job, how often on your primary job have you had to cut back on your hours or turn down overtime because of your family responsibilities?" and "In the past 12 months since you started your current job, how often on your primary job have you spent less time with your family than you wanted because of work responsibilities?" Response choices were frequently; sometimes; rarely; never. For each respective role strain variable, dichotomous measures were created indicating if the participant responded "frequently" or "sometimes" to the role strain questions.

Role satisfaction was measured for work, parenthood, and relationships. For satisfaction with work, employed respondents were asked, "How satisfied are you with this job, as a whole?" Response choices were extremely satisfied; satisfied; neither satisfied nor dissatisfied; dissatisfied; extremely dissatisfied. A dichotomous variable indicating if respondents were dissatisfied or extremely dissatisfied with their job was created. Parents were asked their level of agreement with the following statement: "I am happy as a parent," (strongly agree; agree; neither agree nor disagree; disagree; strongly disagree). Parental unhappiness was coded dichotomously as disagree/strongly disagree or not. For those with a spouse or significant other in the household, relationship dissatisfaction was coded dichotomously, indicating if the respondent was dissatisfied or extremely dissatisfied with the way problems and disagreements are handled; the way family finances are handled; or with their sex life.

Health controls (Wave III and Wave IV). Diet, physical activity, body mass index, smoking, and alcohol use at Wave IV were included to control for concurrent health factors that could affect blood pressure and general health. To adjust for pre-existing health status and conditions that might affect ability of respondents to take on social roles, we included Wave III self-reported health, diagnosis of health conditions, depressive symptoms, and recent hospitalization information in all multivariate models.

Sociodemographic variables (Wave I and Wave IV). Sociodemographic variables included in our analyses included gender; age; education; household income; parental education; race/ethnicity; nativity status, and number of children in household.

Analytical strategy. Weighted univariate distributions for outcome variables, social roles, and sociodemographic variables were examined. For multivariate analyses, systolic and diastolic blood pressure were analyzed using ordinary least squares regression. Hypertension and fair/poor health were analyzed using binomial logistic regression. For each outcome variable, a series of multivariate models were fit to assess effects of multiple roles and associated characteristics. All multivariate models were conducted separately for males and females. In Model 1, the association between the health outcome and individual roles (all included simultaneously) was tested. Model 2 examined the association between number of roles and health outcome. Model 3 tested role strain variables, and Model 4 tested role satisfaction variables. All models included sociodemographic variables and health controls from Waves III and IV. Cases with missing data on sociodemographic variables were coded into separate categories; cases with missing data on all other variables were dropped from analyses. All analyses were conducted using STATA 11.0 (StataCorp, 2009) and weighted using appropriate sampling weights, which adjust for complex sample design, selection, and non-response.

PRELIMINARY RESULTS

Table 1 presents ordinary least squares regression results for systolic and diastolic blood pressure among men. Number of roles was not associated with blood pressure, however working at least 10 hours a week was associated with a 1.53 mm Hg increase in systolic blood pressure among men. Role strain (for employed individuals) and role satisfaction (for those employed, in a relationship, or with kids) were not significantly associated with systolic or diastolic blood pressure (results not shown).

Patterns differed for females (Table 2), such that having more roles, particularly 4 or 5+ roles, was associated with lower blood pressure (marginally significant for systolic blood pressure). Mothers had systolic blood pressure approximately 4 mm Hg lower and diastolic blood pressure 3 mm Hg lower than respondents who had no children (Table 2). Mothers also had lower odds of having hypertension (OR=0.36; p<.05) when role satisfaction variables were accounted for (results not shown). Role strain and role satisfaction variables were not significantly associated with blood pressure among women.

Logistic regression models of fair/poor health among men indicated that number of roles and role strain variables were not significant predictors of fair/poor health (results not shown). Being married or cohabiting was associated with 43% reduced odds of reporting fair/poor health, when taking into account role satisfaction (OR=0.57; p<0.01; results not shown). Men who were dissatisfied with their relationship had 2.38 times the odds of reporting fair/poor health (OR=2.38; p<0.001; results not shown).

Women who worked at least 10 hours per week or who had performed community/volunteer service in the past year had significantly reduced odds of reporting fair/poor health (OR=0.69; p<0.05; OR=0.72; p<0.05, respectively; results not shown). Having 4 or 5+ roles was associated with significantly lower odds of fair/poor health (OR=0.46; p<0.01; OR=0.28; p<0.001, respectively; results not shown). Women who were dissatisfied with their relationship had 82% increased odds of reporting fair/poor health (OR=01.82; p<0.01; results not shown).

Preliminary findings revealed distinct gendered patterns of social roles and health, as well as different patterns of objective and subjective health measures in relation to social roles. Results provide support for the role enhancement perspective among women only, with more social roles associated with lower blood pressure and reduced odds of fair/poor health. Women who were mothers also were at a significant health advantage in terms of lower blood pressure. This paper will discuss possible psychosocial and biological mechanisms linking social roles and health among young adults.

Table 1. Ordinary least squares regression results for blood pressure, 24-32 year old males, Add Health Wave IV (N=4,111)

	Systolic blood pressure		Diastolic blood pressure	
Work ≥10 hours per week	1.53**		0.36	
Married/cohabiting	-0.80		-0.67	
Parent	-0.57		0.31	
Student	-0.77		-0.85	
Attend church/ religious activities	-0.11		-0.27	
Volunteered/community service in past year	0.38		0.76	
Role occupancy (≤1 role)				
2 roles		-0.32		0.05
3 roles		-0.09		-0.38
4 roles		-0.24		-0.41
5-6 roles		-1.10		-0.58
Constant	127.47***	127.68***	79.42***	79.40***
R^2	0.12	0.12	0.10	0.10

Table 2. Ordinary least squares regression results for blood pressure, 24-32 year old females, Add Health Wave IV (N=5,106)

	Systolic blood pressure		Diastolic blood pressure	
Work ≥10 hours per week	0.35		-0.24	
Married/cohabiting	0.17		0.15	
Parent	-4.12*		-3.04*	
Student	0.10		0.13	
Attend church/ religious activities	-0.15		-0.43	
Volunteered/community service in past year	0.10		0.12	
Role occupancy (≤1 role)				
2 roles		-0.10		-0.44
3 roles		-1.26		-1.06†
4 roles		-1.30†		-1.20*
5-6 roles		-1.66†		-1.93*
Constant	114.66***	113.66***	73.05***	72.29***
R^2	0.16	0.16	0.12	0.12

All models control for Wave IV age, race/ethnicity, household income, education, parents' education, nativity status, and number of children; Wave IV diet, physical activity, and body mass index; Wave III self-report general health, history of hospitalization, asthma, diabetes, high cholesterol, cancer, epilepsy, and depressive symptoms.
†$p \leq .1$; * $p \leq .05$; ** $p \leq .01$; *** $p \leq .001$.

REFERENCES

Barnett, R. C. and Baruch, G. K. 1985. Women's involvement in multiple roles, and psychological distress. *Journal of Personality and Social Psychology* 49:135-145.

Barnett, R. C. and Hyde, J. S. 2001. Women, men, work, and family. *American Psychologist* 56:781-796.

Bearman, P. S., Jones, J., & Udry, J. R. 1997. The National Longitudinal Study of Adolescent Health: Research Design.

Chobanian, A.V., Bakris, G. L., Black, H. R., Cushman, W. C., Green, L. A., Izzo Jr., J. L., Jones, D. W., Materson, B. J., Oparil, S., Wright Jr., J. T., and Roccella, E. J. 2003. Seventh report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure. *Hypertension* 42(6):1206-1252.

Coverman, S. 1989. Role overload, role conflict, and stress: Addressing consequences of multiple role demands. *Social Forces* 67(4):965-982.

Entzel, P., Whitsel, E. A., Richardson, A., Tabor, J., Hallquist, S., Hussey, J., Halpern, C. T., and Harris, K. M. 2009. *Add Health Wave IV Documentation: Cardiovascular and Anthropometric Measures* [cited. Available from http://www.cpc.unc.edu/projects/addhealth/data/guides/Wave%20IV%20cardiovascular%20and%20anthropometric%20documentation%2020110209.pdf.

Goode W. J. 1960 A theory of role strain. *American Sociologial Review* 25:483-496.

Matthews, K. A., Cottington, E. M., Talbott, E. Kuller, L. H., and Siegel, J. M. 1987. Stressful work conditions and diastolic blood pressure among blue collar factory workers. *American Journal of Epidemiology* 126(2); 280-291.

Menaghan, E. G. 1989. Role changes and psychological well-being: Variations in effects by gender and role repertoire. *Social Forces* 67:693-714.

Schnall, P. L., Schwartz, J. E., Landsbergis, P. A., Warren, K. and Pickering, T. G. 1998. A longitudinal study of job straing and ambulatory blood pressure: results from a three-year follow-up. *Psychosomatic Medicine* 60(6):697-706.

StataCorp. 2009. *Stata Statistical Software: Release 11*. College Station, TX: StataCorp LP.

Thoits, P. A. 1992. Identity structures and psychological well-being: Gender and marital status comparisons. *Social Psychology Quarterly* 55(3):236-256.

Thoits, P. A. 1983.Multiple identities and psychological well-being: A reformulation and test of the social isolation hypothesis. *American Sociological Review* 48:174-187.

Verbrugge L.M. 1983. Multiple roles and physical health of women and men. *Journal of Health and Social Behavior* 24:16-30.

Vrijkotte, T. G. M., van Doornen, L. J. P, and de Geus, E. J. C. 2000. Effects of work stress on ambulatory blood pressure, heart rate, and heart rate variability. *Hypertension* 35:880-886.