# Examining the Relation between Gender Disparity in Health and Employment, Education, and Family Roles: Evidence from Taiwan

(Extended Abstract)

## BACKGROND

The rapid industrialization and economic growth have made Taiwan a society with a modern health care system and high life expectancy. In 2002 the life expectancy for men is 73.3 years and that for women is 78.82 years (Department of Health, Taiwan. 2003). However, it does not necessarily mean that Taiwanese women are healthier and have been receiving good medical care. Compare to men, Taiwanese women experience inequality in education, income, and social roles (Baraka 1999). The wage discrimination against female workers increased in past decades in Taiwan (Zveglich et al. 1997). While facing the challenge from the incompatibility of work and family roles, many Taiwanese women work in husbands' family firms to fulfill their economic contribution (Yi and Chien 2002). Working in husbands' family firms is "a compromise between demand from both family and work institutions, much more salient than the effect of women's human capital and personal work attitudes" (Yi and Chien 2001: 149). Great gender disparities in work and reward in Taiwanese family firms have been reported (Greenhalgh 1994).

In addition, the interaction effects of education and work on health in Taiwan society have been investigated. Evidence showed that higher levels of perceived job stress were found among those who were younger, with higher education level, and working for longer hours per week, and higher levels of job stress significantly increased risks of multiple health problems for workers. (Cheng and colleagues 2001) For Taiwanese women, the disadvantageous positions in both work and education could largely contribute to their worse health than men.

### Relationship of Gender Roles to Health

In general men report better health than women (Ross and Bird 1994). The socioeconomic stratification between sexes contributes to this sex differences in health (Denton and Walters 1999). Simple occupancy of work and family roles does not explain away gender differences in health (Rushing and Schwabe 1995). Role characteristics or role quality may be more important in determining health than simple role occupancy (Bullers 1994).

Full-time employment predicts slower declines in health (Ross and Mirowsky 1995). Women are more likely to work part-time and have fewer subjective work rewards (Ross and Bird 1994). Even for employed women, wide gender inequalities in terms of pay and power of employed women (O'Campo et al. 2004). Evidence showed that women who were economically inactive were more likely to report

unhealthy than women in paid work (Macran et al. 1994).

Marriage and parenthood are associated with longevity and good mental and physical health (Macintyre 1992; Wyke and Ford 1992). Staying in marriage is beneficial to health (Joung et al. 1997). Men are more likely to be married during their lifetime than women (Ross and Bird 1994), and married men have lower morbidity rates than men who are not married (Joung et al. 1997). Women living in two parent families and having children had better health than women living other family types or on their own. (Lahelma et al. 2002)

Gender differences in health effects of employment were related to family responsibilities and social class (Artazcoz et al. 2004; Gjerdingen et al. 2000). The multiple burden hypothesis predicts that combining a paid job, being married, and having children is likely to have negative effects on women's health (Lahelma et al. 2002). The combination of domestic labor and formal paid employment could predict worse health for women (Blane 2001). Some study suggested that the significant marriage protection effects on health are only for women who are not employed (Waldron et al. 1996). Among full-time employed women, lone mothers with dependent children were found to have particularly poor psyche-social health (Macran et al. 1996). Also, among female workers of low educational level, family demands showed a negative effect in most health indicators. Also, among women of low educational level, living with elderly had showed a negative association with poor health status (Artazcoz et al. 2001, 2004).

Based on the discussion above, this paper intends to examine the relation between gender disparity in health and employment, education, and family roles.

## DATA AND METHODS

The present research analyzes the data in the Panel Study of Family Dynamics (PSFD) in Taiwan. This research was conducted by the Institute of Economics, Academia Sinica since 1999. The objective of the PSFD study was "to construct a panel data set for families, containing the information of economics, social, psychological and ethnological aspects of Chinese families" (Chu, 1999:1). The data set adopted in the present research consisted of three samples. The first sample was interviewed between 1999/01/01 and 1999/03/31; the second sample was interviewed between 2000/01/01 and 2000/03/31; and the third sample was interviewed between 2002/08/01 and 2003/07/31. The mode of the data collection was face to face interview. The target population of the first sample is non-institutionalize individuals who were born during year 1953 to 1963 (age 35 to 45 in 1999). The second sample consists of people who were born during year 1933 to 1953 (age 45 to 65 in 2000). The third sample consists of people who were born during year 1964 to 1976 (age 26

to 38). The sample size was 994, 1959, and 1152 for each sample respectively. The total of the merged data set contains 4015 respondents.

Self-evaluated health and limiting long-standing illness are used as measures of health status for this study. Employment status (unemployment, part-time employment, full-time employment, and long-hours employment) and types of employment (self-employed, familial firms employment, and non-familial firms employment) are measured as individuals' characters of employment. Family roles factors are measured by individuals' marital status, living with dependent children (under 15 years old), and living with people over age 65. Controlled variables include age, gender, and household income.

This paper examines the relation between gender disparity in health and employment, education, and family roles. Three research questions are addressed by applying logistic and OLS models. Age is controlled in all models. First, I explore what explanatory factors mainly account for the gender differentials in health in Taiwan. I estimate logistic models of two health measures and examine which factors can better explain the different odds of being healthy between two genders. Second, I examine whether the relationships between types of employment and health are different by gender. To test the interaction effect of gender and type of employment, I estimate different logistic models of health measures for men and women. Three types of employment are included as main explanatory variables. Educational attainment and household income are controlled for each model. Third, I examine whether the health effects of family demands and employment status are different by gender and educational attainment. Respondents are divided into four group according to their gender and level of educational (high or low), and I estimate OLS regression models of health measures for each group.

**RESULTS**

Adjusted for age and household income, the gender disparity in health is mainly explained by gender differences in employment status. However, the positive health effect of employment decreases as working hours extended to 50 hours or longer per week. Educational attainments account for men's better self-evaluated health, but are not significantly associated with gender differences in limiting long-standing illness. Gender differentials in self-evaluated health are not explained by living arrangement and family roles. However, lone parents are much more likely to have limiting long-standing illness than those with other living arrangement.

The hypothesis that women working in family firms tend to have worse health outcomes is not supported. On the contrary, adjusted for income and education, women working in family business are more likely to report better health than their

counterparts working for non-family firms and self-employed. Meanwhile, men who work for non-family firms report better health than the other two types of employment. On the other hand, women are more likely to report limiting long-standing illness when working in family business than working for non-family firms. In contrast to women, men working in family business are less likely to report limiting long-standing illness. The positive health effects of self-employment are more apparent to men. Compare to working for non-family business, self-employed men report better health and less illness. On the contrary, self-employed women report more illness and less healthy.

The positive health effect of being married (or cohabited) without having young children only shows for lower educated men. For lower educated men, the health effect of employment increase while working hour increases; however, for higher educated men, it decreases while working hour increases. Higher educated women enjoy greater positive health effect of part-time employment than lower educated women. However, if working 40 hours or longer per week, lower educated women reported better health than higher educated women.

**DISCUSSION**

Two main limitations need to be considered for this study. First, for using cross-sectional data, the causal relation between employment, marriage and health cannot be empirically identified.. However, existing evidence also suggested that not all of the poor health usually attached to unemployment can be explained in terms of health selection out of the labor market (Macran et al. 1994). Also, only limited evidence for marriage selection effects (Waldron et al. 1996). Thus, drawing conclusion health protection effects of marriage and work from cross-sectional data can be partly justified..

Second, due to the limitation of data set, this study does not include behavioral factors related health status into analysis. Prior research suggested that lifestyle disadvantages men in health (Ross and Bird 1994), but the effects of social position on health were not fully mediated through behavioral risk factors (Sacker et al. 2001). My prior analysis on Taiwanese health data also showed that effects of health behavior became statistically insignificant after employment status was controlled.

The gender differentials in health for Taiwanese people can be explain by the inequality of employment and education among men and women. In contrast to our hypothesis, working for family firms exhibits positive health effects for women. The analysis also showed health effects of work and family roles may different across people with different gender and education levels. This analysis can help government better locate the groups that need assistances on health programs.

**APPENDIX**

Table 1. Descriptive Statistics for Women and Men in Taiwan, 1999 - 2003

| | Women | Men | Total |
|---|---|---|---|
| Health measures | | | |
| Self evaluated health | 3.63 | 3.80 | 3.71 |
| Limiting long-standing illness | 10.5% | 9.7% | 10.1% |
| Mean Age | 44.89 | 43.76 | 44.34 |
| Household income (thousand NTD/month) | 44.38 | 63.72 | 53.80 |
| Educational attainment | | | |
| Secondary school or less | 10.3% | 17.3% | 13.7% |
| High school | 23.6% | 28.4% | 26.0% |
| Some college | 4.6% | 5.2% | 4.9% |
| College and up | 15.3% | 21.7% | 18.4% |
| Work load | | | |
| Working hours per week | 26.74 | 42.42 | 34.28 |
| Domestic labor hours per week | 17.39 | 5.94 | 11.80 |
| Employment status | | | |
| Unemployment % | 41.2% | 14.9% | 28.4% |
| Part-time employment % | 10.5% | 10.8% | 10.6% |
| Full-time employment % | 30.3% | 40.3% | 35.2% |
| Long-hour employment (50+ hr/wk) % | 16.8% | 30.6% | 23.5% |
| Type of employment | | | |
| Self-employed% | 7.8% | 18.8% | 13.1% |
| Employed by family firms | 7.0% | 1.6% | 4.3% |
| Employed by non-family firms | 44.2% | 64.7% | 54.2% |
| Living arrangement/family roles | | | |
| Living with people >age 65 | 21.0% | 20.8% | 20.9% |
| Singles living without children <age 15 | 20.3% | 20.5% | 20.4% |
| Couples living without children <age 15 | 47.6% | 41.0% | 44.4% |
| Singles living with children <age 15 | 1.7% | 1.5% | 1.6% |
| Couples living with children <age 15 | 30.5% | 37.1% | 33.7% |
| N | 1994 | 2111 | 4105 |

Table 2. Odds Ratio for Sex Differences in Poor Self-reported Health

| | Model 1 | Model 2 | Model 3 | Model 4 |
|---|---|---|---|---|
| Sex | | | | |
| Female | 1.26*** | 1.21*** | 1.21*** | 1.11 |
| Male | - | - | - | - |
| Age | 1.03*** | 1.02*** | 1.02*** | 1.02*** |
| Household income/poverty line | 0.92*** | 0.95*** | 0.95*** | 0.97** |
| Education | | | | |
| College or higher | | 0.58*** | 0.57*** | 0.57*** |
| Some college | | 0.64** | 0.63*** | 0.65** |
| High school | | 0.61*** | 0.61*** | 0.61*** |
| Secondary or below | | - | - | - |
| Family roles | | | | |
| Couples with young children | | | 0.92 | 0.91 |
| Couples without young children | | | 0.88 | 0.87 |
| Singles with young children | | | 1.09 | 1.07 |
| Single without young children | | | - | - |
| Living with elderly | | | 0.91 | 0.91 |
| Employment status | | | | |
| Long-hours employment | | | | 0.72*** |
| Full-time employment | | | | 0.66*** |
| Part-time employment | | | | 0.60*** |
| Unemployment | | | | - |
| -2*Log-likelihood | 4863.541 | 4822.027 | 4818.806 | 4793.545 |

*p<0.1; **p<0.5; ***p<0.01

Table 3. Odds Ratio for Sex Differences in Having Limiting Long-standing Illness

| | Model 1 | Model 2 | Model 3 | Model 4 |
|---|---|---|---|---|
| Sex | | | | |
| Female | 0.92 | 0.90 | 0.89 | 0.77** |
| Male | - | - | - | - |
| Age | 1.03*** | 1.03*** | 1.02*** | 1.02** |
| Household income/poverty line | 0.75*** | 0.77*** | 0.78*** | 0.87*** |
| Education | | | | |
| College or higher | | 0.75 | 0.75 | 0.71 |
| Some college | | 0.53 | 0.51* | 0.49* |
| High school | | 0.84 | 0.84 | 0.82 |
| Secondary or below | | - | - | - |
| Family roles | | | | |
| Couples with young children | | | 0.83 | 0.73* |
| Couples without young children | | | 1.09 | 1.02 |
| Singles with young children | | | 2.32** | 2.24** |
| Single without young children | | | - | - |
| Living with elderly | | | 1.12 | 1.13 |
| Employment status | | | | |
| Long-hours employment | | | | 0.58*** |
| Full-time employment | | | | 0.41*** |
| Part-time employment | | | | 0.52*** |
| Unemployment | | | | |
| -2*Log-likelihood | 2261.151 | 2255.546 | 2247.541 | 2218.003 |

*p<0.1; **p<0.5; ***p<0.01

Table 4. Odds Ratio for Good Self-evaluated Health

| | Model 1 | | Model 2 | | Model3 | |
|---|---|---|---|---|---|---|
| | Men | Women | Men | Women | Men | Women |
| Age | 0.98*** | 0.97*** | 0.98*** | 0.97*** | 0.99** | 0.99** |
| Types of employment | | | | | | |
| Non-familial employment | 1.87*** | 1.61*** | 1.71*** | 1.59*** | 1.69*** | 1.54*** |
| Familial employment | 1.16 | 1.63*** | 1.57 | 1.84*** | 1.61 | 1.93*** |
| Self-employment | 1.78*** | 0.97 | 1.62*** | 0.93 | 1.75*** | 1.01 |
| Unemployment | - | - | - | - | - | - |
| Household income/poverty line | | | 1.07*** | 1.04** | 1.05* | 1.02 |
| Education | | | | | | |
| 10 years or more of education | | | | | 1.60*** | 1.69*** |
| 9 years or less of education | | | | | | |
| -2*Log-likelihood | 2563.572 | 2782.280 | 2314.548 | 2512.891 | 2296.572 | 2492.204 |

*p<0.1; **p<0.5; ***p<0.01

Table 5. Odds Ratio for Having Limiting Long-Standing Illness

| | Model 1 | | Model 2 | | Model3 | |
|---|---|---|---|---|---|---|
| | Men | Women | Men | Women | Men | Women |
| Age | 1.02*** | 1.04*** | 1.02*** | 1.03*** | 1.02* | 1.02** |
| Types of employment | | | | | | |
| Non-familial employment | 0.32*** | 0.38*** | 0.45*** | 0.49*** | 0.44*** | 0.49*** |
| Familial employment | 0.14* | 0.47** | 0.22 | 0.37** | 0.22 | 0.37** |
| Self-employment | 0.28** | 0.54** | 0.39*** | 0.77 | 0.36*** | 0.75 |
| Unemployment | - | - | - | - | - | - |
| Household income/poverty line | | | 0.87** | 0.80*** | 0.90* | 0.80*** |
| Education | | | | | | |
| 10 years or more of education | | | | | 0.68* | 0.82 |
| 9 years or less of education | | | | | - | - |
| -2*Log-likelihood | 1189.030 | 1313.618 | 1070.318 | 1159.207 | 1066.009 | 1157.381 |

*p<0.1; **p<0.5; ***p<0.01

Table 6. Coefficients for Self-Evaluated Health Index (1-5) by Gender

| | Men | | Women | |
|---|---|---|---|---|
| | B | Beta | B | Beta |
| Age | -0.0120*** | -0.142*** | -0.0107*** | -0.118*** |
| Household income/poverty line | 0.0025*** | 0.038*** | 0.0116 | 0.035 |
| Years of Education | | | | |
| 10 years or more | 0.212*** | 0.115*** | 0.217*** | 0.112*** |
| 9 years or less | - | - | - | - |
| Family roles | | | | |
| Couples with young children | 0.0233 | 0.012 | 0.0827 | 0.040 |
| Couples without young children | 0.120* | 0.064* | 0.0213 | 0.011 |
| Singles with young children | -0.177 | -0.023 | 0.119 | 0.015 |
| Single without young children | - | | | |
| Living with elderly | 0.0399 | 0.018 | 0.0188 | 0.008 |
| Employment status | | | | |
| Long-hours employment | 0.302*** | 0.153*** | 0.151** | 0.058** |
| Full-time employment | 0.282*** | 0.152*** | 0.265*** | 0.127*** |
| Part-time employment | 0.387*** | 0.129*** | 0.212*** | 0.067*** |
| Unemployment | - | - | - | - |
| Constant | 3.895 | - | 3.816 | - |
| Adjusted $R^2$ | 0.069 | | 0.093 | |

*p<0.1; **p<0.5; ***p<0.01

Table 7. Coefficients for Self-Evaluated Health Index (1-5) by Gender and Educational Levels

| | Men | | | | Women | | | |
|---|---|---|---|---|---|---|---|---|
| | Lower Education | | Higher Education | | Lower Education | | Higher Education | |
| | B | Beta | B | Beta | B | Beta | B | Beta |
| Age | -0.0152*** | -0.154*** | -0.0080*** | -0.090*** | -0.0127*** | -0.109*** | -0.0062 | -0.058 |
| Household income/poverty line | 0.0034 | 0.044 | 0.0019 | 0.034 | 0.0151 | 0.038 | 0.0032 | 0.012 |
| Family roles | | | | | | | | |
| Couples with young children | 0.128 | 0.057 | -0.0548 | -0.033 | 0.103 | 0.036 | 0.0783 | 0.047 |
| Couples without young children | 0.257** | 0.129** | -0.0087 | -0.005 | -0.0288 | -0.014 | 0.100 | 0.050 |
| Singles with young children | -0.0323 | -0.004 | -0.346 | -0.045 | 0.0122 | 0.001 | 0.119 | 0.023 |
| Single without young children | - | - | - | - | - | - | - | - |
| Living with elderly | 0.0662 | 0.028 | 0.0043 | 0.002 | -0.0129 | -0.005 | 0.0716 | 0.034 |
| Employment status | | | | | | | | |
| Long-hours employment | 0.384*** | 0.175*** | 0.157 | 0.090 | 0.206** | 0.074** | 0.0553 | 0.025 |
| Full-time employment | 0.334*** | 0.154*** | 0.164* | 0.100* | 0.323*** | 0.123*** | 0.201*** | 0.120*** |
| Part-time employment | 0.341*** | 0.117*** | 0.373*** | 0.125*** | 0.180* | 0.054* | 0.213** | 0.079** |
| Unemployment | - | - | - | - | - | - | - | - |
| Constant | 3.905 | - | 4.139 | - | 3.938 | - | 3.917 | - |
| Adjusted $R^2$ | 0.055 | | 0.014 | | 0.046 | | 0.007 | |

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