

# The effects of marriage on volunteering and mental health: moderated mediation analysis

Jia-Jia Syu · Min-Ning Yu · Po-Lin Chen ·  
Pei-Chun Chung

Published online: 15 January 2012  
© Springer Science+Business Media B.V. 2012

**Abstract** Past research has claimed that more volunteering experience could reduce an individual's risk of depression. However, this conclusion may be too simplistic. This study aims to explore the effect of marriage within the complex relationships among volunteering, depression, and subjective well-being, which is utilized as the mediator. The 1,934 participants were randomly recruited from Taiwan. All the participants were asked to complete Subjective Well-Being Scale and Taiwan Depression Scale. The findings indicate that subjective well-being is a bridging-factor between volunteering and depression; whereas the model produces varied results according to marital status. For 'single' and 'married' people, subject well-being is a mediator, while for 'never married' people, that is a suppressor in the relationship between volunteering and depression.

**Keywords** Depression · Marital status · Mental health · Moderated mediation · Structural equation modeling

## 1 Introduction

Volunteering can be defined as an activity that is beneficial to the lives of other people, groups, or organizations. Though the question of whether participation in volunteering work results in personal rewards is still a topic under discussion, volunteering generally reaps no financial rewards (Smith 1982; Wilson 2000). This begs the question of what the predominant motivation for volunteering is. A potential reason identified in a previous study suggests that, despite no concrete remuneration existing in volunteer work, people may receive latent or unseen advantages from engaging in the process (Wilson 2000). These benefits may include improved physical health (Stephan 1991; Musick et al. 1999; Oman et al. 1999; Rogers 1996;

---

J.-J. Syu · M.-N. Yu (✉) · P.-L. Chen · P.-C. Chung  
Department of Education, National Chengchi University, Mailbox No.1-433, Muzha Post Office, Sec. 2,  
Zhinan Rd., Wenshan Dist., Taipei City 11699, Taiwan, ROC  
e-mail: mnyu@nccu.edu.tw

J.-J. Syu  
e-mail: debbysyu@gmail.com

Sabin 1993), a reduction of antisocial behavior (Wilson 2000), enhancing a sense of citizenship (Knoke 1990; Stolle 1998), and improved mental health (Krause et al. 1992; Mirowsky and Ross 1989).

### 1.1 Volunteer work and mental health

The mental and social resources acquired from participating in volunteer work could enable individuals to confront negative feelings, such as depression and anxiety, more positively (Musick and Wilson 2003). Certain studies have attempted to explain this association by claiming that volunteering provides individuals with an opportunity to dedicate themselves to an activity, and consequently experience a sense of self-validation. Experiences of this nature allow people to feel unique from others, possibly impeding depression (Krause et al. 1992; Mirowsky and Ross 1989; Wilson 2000). Several studies have proposed that volunteering experience could decrease or even prevent depression. A finding supporting this hypothesis appeared in the longitudinal study on Asset and Health Dynamics Among the Oldest Old Study (AHEAD). The data were acquired from 1993 to 2000, and the study attempted to determine the relationship between physical and mental health in persons over 70 years old, who had over 100 h of volunteering experience in 1993. The results showed that volunteering experience could affect their self-reported health condition (Lum and Lightfoot 2005). Furthermore, the meta-analysis study, which integrated 37 studies on the effects of volunteering experiences in elders, found a positive relationship between volunteering experience and life-satisfaction. Moreover, in another database study on third wave Americans Changing Lives (ACL), the results indicated that the more hours spent volunteering, the higher the subjective well-being, which was measured according to self-rated health, functional dependency, and depressive symptomatology, occurring in elders over 60 years of age (Morrow-Howell et al. 2003).

### 1.2 Subjective well-being as a mediator

The relation between depression and subjective well-being need more discussion. Previous research has predominantly treated depression and well-being as bipolar concepts; that is, if an individual stated that they were happy, this was understood that they would not be depressed. For example, in Berg-Weger et al. (2000), the path coefficient between depression and well-being was assumed to be significantly negative, which implied that the assumption of well-being and depression in the same dimension was confirmed. However, there are the increasing evidences indicating that these two categories of emotions tend to function relatively independently (Huppert and Whittington 2003). Much akin to Keyes' theory, depression and subjective well-being are measured in different dimensions. Keyes (2002); Keyes and Waterman (2003); Keyes (2004, 2005, 2006a,b, 2007) asserts that mental health symptoms (subjective well-being) and mental illness symptoms are essentially existed as two different measurement dimensions. They are utilized as measurements of the collective mental health state of an individual, and each dimension is viewed as a bipolar variable. Thus, one might have a high measure of mental health symptoms, as well as mental illness symptoms simultaneously. By this definition, depression and well-being are concepts in different categories. And it is apprehensible to investigate if the effect of volunteering on depression is affected by subjective well-being.

### 1.3 Marital status as a moderator

Numerous studies have investigated the relationship between volunteering and mental health; however, it remains uncertain. One reason for this is that there were only cross-sectional studies in the past. Thus, identifying the exact path affected between mental health and volunteering experience is difficult. Another reason is that the effects of the volunteering experience on subjective well-being are still being influenced by some moderators, such as marital status (McIntosh and Danigelis 1995; Wilson 2000; Musick et al. 1999; Thoits and Hewitt 2001). A previous study referred that there are variables to moderate and mediate the relationships among volunteer experience, depression, and subjective well-being, and marital status is also mentioned. Mori et al. (2002) investigated the relationship between sex-role orientation, marital status, and mental health, and established that unmarried women suffer from a poorer mental health condition; while married women experience a greater sense of distress in their working environments. Similarly, Julianne et al. (2008) identified that married people experience enhanced life-satisfaction, less depression, and less distress compared to single people. For people with different marital statuses, the influence of volunteering on subjective well-being and depression was also different. Compared to unmarried or cohabiting people, the experience of volunteering was more effective in reducing depression for married/cohabiting persons (Morrow-Howell et al. 2003). In summation, the relationship between volunteering, depression, and subjective well-being could vary according to marital status.

The present study investigates the complex association between volunteering and depression. Specifically, this paper explores the direct effects of volunteer work on depression and conduct tests to determine whether subjective well-being acts as a mediator in this relationship. Furthermore, this study examines the mediation model by using marital status as a moderator.

## 2 Methods

### 2.1 Participants and procedure

The participants were selected from people in Taiwan who were between 20 and 65 years of age. The data were collected via two methods. One of these included sending an online survey address via cellphone messages. All the phone numbers were obtained from a telephone company legally. The sampling percentage at each age level and county were based on governmental statistical data. A concern was that cell phone sampling might not be sufficiently extensive and inconvenient for older people. Thus, researchers also mailed hard copies of questionnaires to schools for adult, including all community colleges, human resource departments, elderly service centers in Taipei City, and teacher training centers in colleges. Those in charge assisted in forwarding the online survey and hard copies of questionnaires to their elderly staff and students. The data collection process occurred over a period of one and a half months.

After data screening, 1,934 valid participants were found, of which 67% were females. Regarding the level of education, 2.8% were at the primary school level, 3.2% were at the junior high school level, 27.1% were at the high school level, 52.7% were at the college level, and 14% were at the graduate level.

## 2.2 Measure

### 2.2.1 Subjective well-being scale

The subjective well-being scale includes three subscales, which are defined as psychological well-being, social well-being, and emotional well-being. Some items of the psychological well-being subscale were adopted and translated from Ryff (1989, 1989) and Ryff and Keyes (1995). The items of the social well-being subscale were translated from that of Keyes (1998), and the items of the emotional well-being subscale adopted parts of related items in Diener (1984) and Diener et al. (1999). All content was translated to Chinese by back translation. The questionnaire comprised 39 items with a Likert-type rating scale, in which five denoted a strong agreement and one denoted strong disagreement. A higher total score indicated an enhanced state of well-being in the individual. A structure equation model was used to build validation of three types of scales separately, and second-order confirmation factor analysis was used to test the entire questionnaire. The rigorous procedure of testing could refer to previous research (see Yu et al. 2011).

### 2.2.2 Taiwan Depression Scale

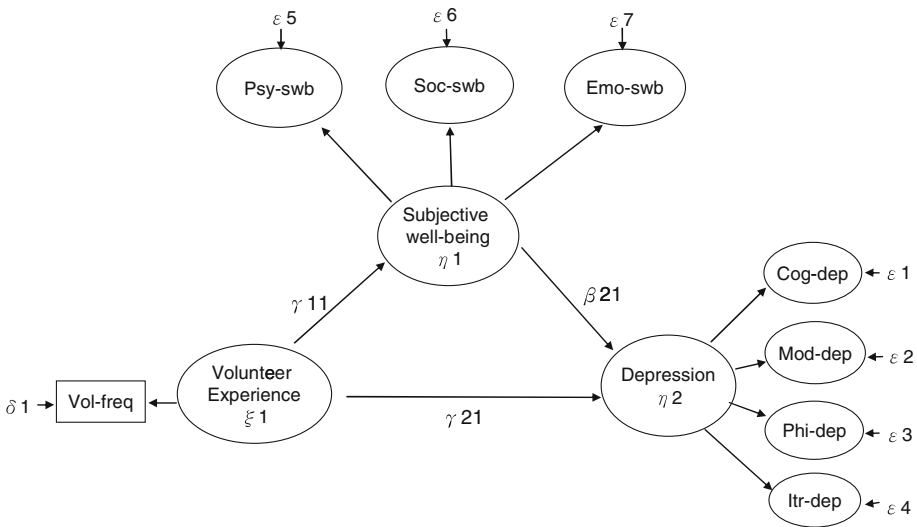
The Taiwan Depression Scale was developed by Yu et al. (2008) and Yu et al. (2011). The scale is divided into four dimensions: cognitive, emotive, physical, and interpersonal. All items are described as depressive disorder syndromes. The score, ranging from 1 to 4, represents the frequency, from 「Always」 to 「Never」. In the data analysis stage, the score was transferred, indicating that a higher score equals less depression. The construct validation and reliability of the scale were tested by a rigorous process. For more details regarding the testing process, one can refer to the previous study conducted by our research team (see Yu et al. 2008; Yu et al. 2011).

### 2.2.3 Volunteering experience

Volunteering experience was measured via one multiple-choice question in the questionnaire: the frequency of volunteering. The four alternative answers and their corresponding coding numbers are as follows: 「1」 is never; 「2」 is a few times in a year; 「3」 is a few times in 1 month; and 「4」 is a few times in 1 week.

### 2.2.4 Marital status

Marital status was obtained from and classified according to the answer given in the background questions as well. Three categorical statuses were in this study, as follows: The first is 'never married', which refers to people who have never been married. The second is 'single', which represents people who are not currently in a marital relationship, but could have been married previously or have lost their spouse. The last status is 'married', which denotes people who are currently in a marriage.



**Fig. 1** The mediation structure in the study

### 2.3 Analyses

#### 2.3.1 Mediation and moderated mediation

The objective of the mediated design was to identify the mediating process between the independent variable and dependent variable (Muller et al. 2005). The mediation study maintains that the relationship between the independent and dependent variable might differ due to the mediator (Woodworth 1926). According to Baron and Kenny (1986), ascertaining the presence of a mediator is based on whether the effective power of the independent variable on dependent variable is reduced, or even becomes nonsignificant due to the addition of a mediator (Baron and Kenny 1986; Wu and Zumbo 2008). However, the mediation model might differ or not work for all participants (Kraemer et al. 2008), and could vary in the subgroups of the participants. For example, the relationship between intentions and behavior was mediated by action planning, while the level of intentions moderated the mediation. The mediation effect is stronger in participants with higher intentions scores (Weidemann et al. 2009). That is, the influence of the mediator is dependent on the levels of a moderator variable. This occasion is referred to as ‘moderated mediation’ (Edwards and Lambert 2007).

In this study, the mediation effect was tested via a structure equation model in two stages to exclude the error terms and ensure that the model provides a true measurement. Model 2 represents the model with a mediator, while model 1 represents the model prior to the addition of a mediator. The interaction model, based on the research assumptions, is shown in Fig. 1. Volunteering experience might affect individuals’ depression (direct effects,  $\gamma_{21}$ ), but the relationship might be reduced or not exist when subjective well-being is included (indirect effects,  $\gamma_{11} \times \beta_{21}$ ). These three latent variables contain 1–4 indicators. The latent exogenous variable is the volunteering experience ( $\xi_1$ ), which was measured by the frequency of volunteering ( $x_1$ ). There are two latent endogenous variables. One is subjective well-being ( $\eta_1$ ), of which the indicators are psychological well-being ( $Y_5$ ), social well-being ( $Y_6$ ), and emotional well-being ( $Y_7$ ). Another latent endogenous variable is depression ( $Y_7$ ), of which

**Table 1** Correlation coefficient among manifest variables for all participants (above the diagonal) and never married persons (below the diagonal)

	1	2	3	4	5	6	7	8
1. Cognitive depression	1	0.76***	0.66***	0.64***	0.46***	0.43***	0.47***	0.10***
2. Emotive depression	0.73***	1	0.72***	0.57***	0.34***	0.34***	0.43***	0.09***
3. Physical depression	0.64***	0.70***	1	0.59***	0.32***	0.31***	0.36***	0.04
4. Interpersonal depression	0.62***	0.54***	0.58***	1	0.42***	0.45***	0.42***	0.14***
5. Psychological well-being	0.45***	0.32***	0.29***	0.40***	1	0.56***	0.52***	0.17***
6. Social well-being	0.40***	0.30***	0.28***	0.41***	0.55***	1	0.52***	0.25***
7. Emotional well-being	0.47***	0.41***	0.35***	0.40***	0.51***	0.48***	1	0.21***
8. Volunteer experience	0.027	-0.01	-0.02	0.08**	0.18***	0.22***	0.15***	1

$N_{all\ participants} = 1,937, N_{never\ married\ persons} = 1,301$   
 \*\* $P < 0.01, ***P < 0.001$

the indicators are cognition depression ( $Y_1$ ), emotion depression ( $Y_2$ ), physical depression ( $Y_3$ ), and interpersonal depression ( $Y_4$ ).  $Y_1$ – $Y_7$  are composite scores that are the sum of items with the same factors. The mediation model was verified under three types of marital statuses, that is, the moderator effect.

### 3 Results

#### 3.1 The relationship among volunteering, subjective well-being, and depression

The upper triangle matrix in Table 1 shows the correlation between all variables for all participants. The correlation is between low and moderate ( $r = 0.14$ – $0.76$ ).

#### 3.2 Mediation effects

##### 3.2.1 Never married person

The lower triangle matrix in Table 1 shows the moderate correlation (0.08–0.73) between eight variables for never married people ( $N = 1,301$ ). Mediation testing indicated that both models fit the data when relaxing the relation between  $\epsilon_1$  and  $\epsilon_3$  in model 2 (Yu 2006). The  $\chi^2$  of model 1 and model 2 are 15.816 ( $P < 0.05$ ) and 128.856 ( $P < 0.05$ ), respectively. RMSEA of model 1 is 0.048, and model 2 is 0.073. Both are acceptable. SRMR of model 1 is 0.022 and that of model 2 is 0.045; AGFI of model 1 is 0.977 and that of model 2 is 0.936; GFI in model 1 is 0.996 and that in model 2 is 0.982; CN of model 1 is 1,003 and that of model 2 is 310. Both are higher than the criteria value of 200.

##### 3.2.2 Single person

The above diagonal of Table 2 shows the correlation between eight variables for single people; a total of 75 people are under analysis. The correlation coefficient is between 0.25 and 0.79. Regarding the mediation testing, the  $\chi^2$  of model 1 is 7.530 and that of model 2 is 24.372, both of which are nonsignificant. The values of RMSEA are acceptable, and are 0.069 and 0.051 for model 1 and model 2, respectively. The SRMR of model 1 is 0.035 and that of

**Table 2** Correlation coefficient among manifest variables for single persons (above the diagonal) and married persons (below the diagonal)

	1	2	3	4	5	6	7	8
1. Cognitive depression	1	0.79**	0.76**	0.75**	0.61**	0.50**	0.36**	0.15
2. Emotive depression	0.79**	1	0.79**	0.72**	0.58**	0.54**	0.45**	0.33**
3. Physical depression	0.69**	0.75**	1	0.71**	0.52**	0.54**	0.42**	0.27*
4. Interpersonal depression	0.64**	0.60**	0.60**	1	0.51**	0.60**	0.38**	0.21
5. Psychological well-being	0.46**	0.32**	0.34**	0.46**	1	0.66**	0.64**	0.22
6. Social well-being	0.44**	0.35**	0.31**	0.47**	0.59**	1	0.62**	0.27*
7. Emotional well-being	0.45**	0.41**	0.35**	0.44**	0.53**	0.54**	1	0.25*
8. Volunteer experience	0.15**	0.16**	0.07	0.18**	0.15**	0.26**	0.27**	1

$N_{\text{single persons}} = 75$ ,  $N_{\text{married persons}} = 558$

\*\* $P < 0.01$ , \*\*\* $P < 0.001$

model 2 is 0.041; the AGFI of model 1 is 0.883 and that of model 2 is 0.848; GFI in model 1 is 0.993 and that in model 2 is 0.994; CN of model 1 is 166 and that of model 2 is 121, which is slightly lower than the criterion of 200. The unstable results for the 'single' group might be accounted for due to the small sample size.

### 3.2.3 Married person

The below diagonal of Table 2 shows the moderate correlation (correlation coefficient is from 0.18 to 0.79) among eight variables for 558 married people. Both models fit the data when relaxing the relation between  $\varepsilon_2$  and  $\varepsilon_4$  in model 1, and the relation between  $\varepsilon_1$  and  $\varepsilon_2$ ,  $\varepsilon_2$  and  $\varepsilon_3$ ,  $\varepsilon_1$  and  $\varepsilon_4$  in model 2 (Yu 2006). Referring to the model fit index, the  $\chi^2$  of model 1 and model 2 are 12.494 and 56.745, respectively; both are significant. The RMSEA of model 1 is 0.061, and that of model 2 is 0.070. Both of them are at an acceptable level. SRMR of model 1 is 0.023 and that of model 2 is 0.030; AGFI of model 1 is 0.967 and that for model 2 is 0.941; the GFI in model 1 is 0.995 and that in model 2 is 0.988; CN in model 1 is 605, and that in model 2 is 315. Both of them qualify the criteria value of 200.

### 3.3 Moderated mediation

Though the three mediation models are all significant, the mediator (subjective well-being) plays a different role among the groups. Table 3 shows the standardized coefficient of the mediation model for the three groups. For the 'never married' group, model 1 shows that volunteer experience has no effect on depression ( $\gamma_{21} = 0.01$ ,  $P > 0.05$ ). However, when subjective well-being was added (model 2), volunteer experience was shown to work directly and negatively on depression ( $\gamma_{21} = -0.16$ ,  $P < 0.01$ ). There is also an indirect effect on depression, which was mediated positively by subjective well-being ( $\gamma_{11} = 0.25$ ,  $P < 0.01$ ;  $\beta_{21} = 0.66$ ,  $P < 0.01$ ). The indirect effect on depression is 0.165, which is higher than the direct effect. This means that for a never married person, subjective well-being mediated the relationship between volunteering experience and the person's level of depression; however, more volunteering experience might slightly increase the degree of depression.

In the 'single' group, in model 1, volunteering experience had a positive effect on depression ( $\gamma_{21} = 0.28$ ,  $P < 0.01$ ). Regarding subjective well-being (model 2), the direct effect of volunteering experience on depression ( $\gamma_{21} = 0.06$ ,  $P > 0.05$ ) disappears and can only be

**Table 3** The standardized coefficient of mediation model by three groups

Parameters	Never married		Single		Married	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
$\gamma_{21}$	0.01	-0.16***	0.28**	0.06	0.17***	-0.03
$\gamma_{11}$		0.25***		0.30**		0.30***
$\beta_{21}$		0.66***		0.71***		0.67***
$\lambda_{11}$	1.00***	1.00***	1.00***	1.00***	1.00***	1.00***
$\lambda_{12}$	0.92	0.91	0.88	0.88	0.85	0.95
$\lambda_{22}$	0.80***	0.81***	0.90***	0.90***	0.93***	0.72***
$\lambda_{32}$	0.87***	0.83***	0.87***	0.87***	0.81***	0.72***
$\lambda_{42}$	0.67***	0.69***	0.82***	0.83***	0.75***	0.86***
$\lambda_{51}$		0.74***		0.84***		0.75***
$\lambda_{61}$		0.70***		0.81***		0.77***
$\lambda_{71}$		0.71***		0.74***		0.72***
$\delta_1$	-	-	-	-	-	-
$\varepsilon_1$	0.16***	0.17***	0.22**	0.22***	0.27***	0.10*
$\varepsilon_2$	0.36***	0.34***	0.19***	0.19***	0.13***	0.48***
$\varepsilon_3$	0.24***	0.31***	0.24***	0.25**	0.35***	0.49***
$\varepsilon_4$	0.55***	0.53***	0.32***	0.32***	0.44***	0.26***
$\varepsilon_5$		0.45***		0.30**		0.43***
$\varepsilon_6$		0.50***		0.34***		0.41***
$\varepsilon_7$		0.50***		0.46***		0.49***

\* $P < 0.05$ , \*\* $P < 0.01$ , \*\*\* $P < 0.001$

investigated via subjective well-being ( $\gamma_{11} = 0.30, P < 0.01$ ;  $\beta_{21} = 0.71, P < 0.01$ ). The indirect effect is 0.213, which is higher than the direct effect that volunteering experience has on depression (0.06). For the ‘single’ group, therefore, the decrease of depression can not only be considered in relation to the increase of volunteer experience. Subjective well-being has to be included and accounted for simultaneously.

Lastly, for the ‘married’ group, one can see that volunteer experience affects depression positively in model 1 ( $\gamma_{21} = 0.17, P < 0.01$ ). Concerning subjective well-being (model 2), the influence of volunteering experience on depression ( $\gamma_{21} = -0.03, P > 0.05$ ) does not even appear to exist, and can only be explained via subjective well-being ( $\gamma_{11} = 0.30, P < 0.01$ ;  $\beta_{21} = 0.67, P < 0.01$ ). The indirect effect is 0.201, which is higher than the direct effect that volunteer experience has on depression (-0.03). Therefore, for a married person, merely endeavoring to increase the volunteering experience might not lead to an absolute decrease in depression, unless subjective well-being is considered simultaneously.

#### 4 Discussion and conclusions

This study explores the influence of volunteering on depression. The findings indicate that subjective well-being bridges the relationship between volunteering and depression, whereas the model is varied by different marital statuses. That is, the effective influence of subjective



well-being on the relationship between volunteering and depression in fact differs among never married people, single people, and married people.

According to the results of the mediation analysis, we know that when subjective well-being is considered simultaneously, volunteering experience can reduce depression efficiently. This implies that the decrease in depression would be limited without considering subjective well-being. A reduction in the level of depression might not be successful only by means of improved volunteering experience. Instead, one should ensure that this type of volunteering experience primarily increases subjective well-being. A greater possibility of confirming the relationship between volunteer experience and depression consequently exists.

Marital status moderates the mediation effect of subjective well-being on volunteering experience and depression. For never married people, volunteering experience has no effect on depression. However, the effect could occur when subjective well-being is considered. This means that volunteering experience can affect depression by individuals only in one of these situations, in which it can enhance subjective well-being. This type of relationship is distinct from the other two groups, namely single and married people. The direct influence of volunteering experience on depression disappears when considering subjective well-being for these two groups. We can thus surmise that volunteering experience can reduce depression, though the impact is replaced by subjective well-being. In this instance, subjective well-being could be regarded as a suppressor in the mediation model for the 'never married' group (Yu 1994, 1995), while it is a mediator in the model for the 'single' and 'married' groups. Therefore, marital status plays a critical role in the relationship between these factors. For people with different marital statuses, the mediation effect is also dissimilar.

Past studies have indicated that marriage could lead to happiness and a greater sense of subjective well-being (Julianne et al. 2008). According to the outcome of the present study, subjective well-being serves as a bridging-factor between volunteering and depression; one could thus broaden the scope of 'marriage' to include everything from marriage to marital experience. The relationship between volunteering and depression is similar for single and a married people because the impact of subjective well-being on single people, who were once married but are no longer, is great. Moreover, compared to currently married people, single people experience greater difficulty in reducing depression by increasing their subjective well-being and frequently volunteering.

**Acknowledgment** The authors would like to thank National Science Council of Republic of China for the support given to this study. (Project Number: NSC 97-2410-H-004-122-MY2).

## References

- Baron, R.M., Kenny, D.A.: The moderator-mediator variable distinction in social psychological research: conceptual, strategic, and statistical considerations. *J. Pers. Soc. Psychol.* **51**(6), 1173–1182 (1986)
- Berg-Weger, M., Rubio, D.M., Tebb, S.S.: Depression as a mediator: viewing caregiver well-being and strain in a different light. *Fam. Soc. J. Contemp. H.* **81**(2), 162–173 (2000)
- Diener, E.D.: Subjective well-being. *Pol. Psychol. Bull.* **95**, 542–575 (1984)
- Diener, E.D., Suh, E.M., Lucas, R.E., Smith, H.L.: Subjective well-being: three decades of progress. *Pol. Psychol. Bull.* **125**, 276–302 (1999)
- Edwards, J.R., Lambert, L.S.: Methods for integrating moderation and mediation: a general analytical framework using moderated path analysis. *Psychol. Methods* **12**(1), 1–22 (2007)
- Huppert, F.A., Whittington, J.E.: Evidence for the independence of positive and negative well-being: implications for quality of life assessment. *Br. J. Health Psych.* **8**, 107–122 (2003)

- Julianne, H.L., Wendy, B., Brandon, J.: 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. *Ann. Behav. Med.* **35**(2), 239–244 (2008)
- Keyes, C.L.M.: Social well-being. *Soc. Psycho. Quart.* **61**, 121–140 (1998)
- Keyes, C.L.M.: The mental health continuum: from languishing to flourishing in life. *J. Health Soc. Behav.* **43**(2), 207–222 (2002)
- Keyes, C.L.M.: The nexus of cardiovascular disease and depression revisited: the complete mental health perspective and the moderating role of age and gender. *Aging Ment. Health* **8**, 266–274 (2004)
- Keyes, C.L.M.: Mental illness and/or mental health? Investigating axioms of the complete state model of health. *J. Consult. Clin. Psych.* **73**(3), 539–548 (2005)
- Keyes, C.L.M.: Mental health in adolescence: is American's youth flourishing? *Am. J. Orthopsychiat.* **76**, 395–402 (2006a)
- Keyes, C.L.M.: Subjective well-being in mental health and human development research worldwide: an introduction. *Soc. Indic. Res.* **77**, 1–10 (2006b)
- Keyes, C.L.M.: Promoting and protecting mental health as flourishing: a complementary strategy for improving national mental health. *Am. Psychol.* **62**, 95–108 (2007)
- Keyes, C.L.M., Waterman, M.B.: Dimensions of well-being and mental health in adulthood. In: Bornstein, M.H., Davidson, L., Keyes, C.L.M., Moore, K.A. (eds.) *Well-Being: Positive Development Across the Life Course.*, pp. 477–497. Lawrence, Mahwah (2003)
- Krause, N., Herzog, A., Baker, E.: Providing support for others and well-being in later life. *J. Gerontol.* **47**, 300–311 (1992)
- Knoke, D.: Networks of political action: toward theory construction. *Soc. Forces.* **68**, 1041–1065 (1990)
- Kraemer, H.C., Kraemer, M., Essex, M., Kupfer, D.J.: How and why criteria defining moderators and mediators differ between the Baron & Kenny and MacArthur approaches. *Health Psychol.* **27**(20), 101–108 (2008)
- Lum, T.Y., Lightfoot, E.: The effects of volunteering on the physical and mental health of older people. *Res. Aging.* **27**(1), 31–55 (2005)
- McIntosh, B., Danigelis, N.: Race, gender and the relevance of productive activities for elders' affect. *J. Gerontol.* **50**, 229–240 (1995)
- Mirowsky, J., Ross, C.: *Social Causes of Psychological Distress.* Aldine deGruyter, New York (1989)
- Morrow-Howell, N., Hinterlong, J., Rozario, P.A., Tang, F.: Effects of volunteering on the well-being of older adults. *J. Gerontol. B Psychol. Sci. Soc. Sci.* **58B**, 137–145 (2003)
- Mori, M., Nakashima, Y., Yamazaki, Y., Kurita, H.: Sex-role orientation, marital status and mental health in working women. *Arch. Womens Ment. Health* **5**, 161–176 (2002)
- Muller, D., Judd, C.M., Yzerbyt, V.Y.: When moderation is mediated mediation is moderated. *J. Pers. Soc. Psychol.* **89**, 852–863 (2005)
- Musick, M., Herzog, A., House, J.: Volunteering and mortality among older adults: findings from a national sample. *J. Gerontol.* **54B**, 173–180 (1999)
- Musick, M.A., Wilson, J.: Volunteering and depression: the role of psychological and social resources in different age groups. *Soc. Sci. Med.* **56**(2), 259–269 (2003)
- Oman, D., Thoreson, C., McMahon, K.: Volunteerism and mortality among community dwelling elderly. *J. Health Psychol.* **4**, 301–316 (1999)
- Rogers, R.: The effects of family composition, health, and social support linkages on mortality. *J. Health Soc Behav.* **37**, 326–338 (1996)
- Ryff, C.D.: Happiness is everything, or is it? Explorations on the meaning of psychological well-being. *J. Pers. Soc. Psychol.* **57**, 1069–1081 (1989)
- Ryff, C.D., Keyes, C.L.M.: The structure of psychological well-being revisited. *J. Pers. Soc. Psychol.* **69**, 719–727 (1995)
- Sabin, E.P.: Social relationships and mortality among the elderly. *J. Appl. Gerontol.* **12**, 44–60 (1993)
- Smith, D.: Altruism, volunteers, and volunteerism. In: Harman, J. (ed.) *Volunteerism in the Eighties: Fundamental Issues in Voluntary Action.*, pp. 23–44. University Press of America, Washington (1982)
- Stephan, P.: Relationships among market work, work aspirations and volunteering: the case of retired women. *Nonprof. Volunt. Sec. Q.* **20**, 225–236 (1991)
- Stolle, D.: Bowling together, bowling alone: the development of generalized trust in voluntary associations. *Polit. Psychol.* **19**, 497–525 (1998)
- Thoits, P., Hewitt, L.: Volunteer work and well-being. *J. Health Soc. Behav.* **42**, 115–131 (2001)
- Weidemann, A.U., Schuz, B., Sniehotta, F., Scholz, U., Schwarzer, R.: Disentangling the relation between intentions, planning, and behaviour: a moderated mediation analysis. *Psychol. Health* **24**(1), 67–79 (2009)
- Wilson, J.: Volunteering. *Annu. Rev. Sociol.* **26**, 215–240 (2000)
- Woodworth, R.S.: Dynamic psychology. In: Murchison, C. (ed.) *Psychology of 1925*, International University Series in Psychology., pp. 111–126. Clark University Press, Worcester (1926)

- Wu, A.D., Zumbo, B.D.: Understanding and using mediators and moderators. *Soc. Indic. Res.* **87**(3), 367–392 (2008)
- Yu, M.N.: The influence of suppressors in data analysis(I). *J. Educ. Res.* **40**, 39–44 (1994)
- Yu, M.N.: The influence of suppressors in data analysis(II). *J. Educ. Res.* **41**, 42–54 (1995)
- Yu, M.N.: *Latent Variable Models: The Application of SIMPLIS*. H-EDU, Taipei (2006)
- Yu, M.N., Hsieh, J.C., Lin, S.Y., Chen, P.L., Tseng, H.C.: Confirmatory study of model of teachers' subjective well-being. *Psychol. Test* **58**(1), 55–85 (2011)
- Yu, M.N., Huang, H.Y., Liu, Y.J.: The development and psychometric study of Taiwan Depression Scale. *Psychol. Test* **58**(3), 479–500 (2011)
- Yu, M.N., Liu, Y.J., Li, R.H.: The practical usage of cutoff score in the Taiwan Depression Scale. *J. Educ. Res. Dev.* **4**(4), 231–258 (2008)

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.