

A Revised Thai Multi-Dimensional Scale of Perceived Social Support

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In order to ensure the construct validity of the three-factor model of the Multi-dimensional Scale of Perceived Social Support (MSPSS), and based on the assumption that it helps users differentiate between sources of social support, in this study a revised version was created and tested. The aim was to compare the level of model fit of the original version of the MSPSS against the revised version - which contains a minor change from the original. The study was conducted on 486 medical students who completed the original and revised versions of the MSPSS, as well as the Rosenberg Self-Esteem Scale (Rosenberg, 1965) and Beck Depression Inventory II (Beck, Steer, & Brown, 1996). Confirmatory factor analysis was performed to compare the results, showing that the revised version of MSPSS demonstrated a good internal consistency - with a Cronbach's alpha of .92 for the MSPSS questionnaire, and a significant correlation with the other scales, as predicted. The revised version provided better internal consistency, increasing the Cronbach's alpha for the Significant Others sub-scale from 0.86 to 0.92. Confirmatory factor analysis revealed an acceptable model fit: χ^2 128.11, *df* 51, $p < .001$; TLI 0.94; CFI 0.95; GFI 0.90; PNFI 0.71; AGFI 0.85; RMSEA 0.093 (0.073-0.113) and SRMR 0.042, which is better than the original version. The tendency of the new version was to display a better level of fit with a larger sample size. The limitations of the study are discussed, as well as recommendations for further study.

Keywords: social support, MSPSS, model fit, confirmatory factor analysis.

En este trabajo se creó y probó una nueva versión de la Escala multidimensional de soporte social percibido (siglas en inglés: MSPSS); con el objetivo de asegurar su validez de constructo. Se comparó el nivel de ajuste del modelo de la versión original del MSPSS con la versión revisada que incluye cambios menores con respecto a aquella. En el estudio participaron 486 estudiantes de medicina que completaron ambas versiones del instrumento en cuestión, así como la Escala de autoestima de Rosenberg y el inventario de depresión de Beck II (Beck, Steer, & Brown, 1996). El análisis factorial confirmatorio realizado para comparar los resultados, mostró que la versión revisada del cuestionario MSPSS presentaba una buena consistencia interna, con un alfa de Cronbach de .92, y una correlación significativa con otras escalas, tal y como se predijo. La versión revisada mostró una mejor consistencia interna, incrementándose el alfa de Cronbach para la subescala de Otros significantes de .86 a .92. El análisis factorial confirmatorio reveló un aceptable modelo de ajuste: χ^2 128.11, *df* 51, $p < 0.001$; TLI 0.94; CFI 0.95; GFI 0.90; PNFI 0.71; AGFI 0.85; RMSEA 0.093 (0.073-0.113) y SRMR 0.042, mejorándose la versión original. La nueva versión tendía a mostrar un mejor nivel de ajuste con un mayor tamaño muestral. Se discuten las limitaciones del estudio, así como las recomendaciones para estudios futuros.

Palabras clave: apoyo social, MSPSS, modelo de ajuste, análisis factorial confirmatorio.

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The Multi-dimensional Scale of Perceived Social Support (MSPSS), developed by Zimet, Dahlem, Zimet, and Farley, (1988), is a widely-used social support measure which judges an individual's perception of how much outside social support he or she receives (Dahlem, Zimet, & Walker, 1991; Ege, Timur, Zincir, Geçkil, & Sunar-Reeder, 2008; Frasure-Smith et al., 2000; Zimet et al., 1988; Zimet, Powell, Farley, Werkman, & Berkoff, 1990). It is a brief, easy to administer self-reporting tool which contains twelve items rated on a five-point Likert-type scale, plus has been tested on different age groups and across different cultural backgrounds and found to be a reliable and valid measurement instrument (Bruwer, Emsley, Kidd, Lochner, & Seedat, 2008; Clara, Cox, Enns, Murray, & Torgrudc, 2003; Ramaswamy, Aroian, & Templin, 2009).

Why was the revised version proposed?

Although most researchers have shown that the MSPSS is a three-factor construct which is able to take into account the latent factors of Family, Friends and Significant Others across a variety of circumstances; for example, different age groups, different cultural backgrounds and different specific disordered samples (Clara et al., 2003; Pedersen, Spinder, Erdman, & Denollet, 2009; Vaingankar, Abidin, & Chong, 2012; Zimet et al., 1988; Zimet et al., 1990), some investigators, such as Stanley, Beck, and Zebb, (1998), Chou (2000), Cheng and Chan (2004) and Wongpakaran et al. (2011), have found that a two-factor model can compete with the original three-factor structure where the sub-scale Significant Others is merged with either the Friends or Family sub-scales. However, this depends upon the characteristics of the sample; for instance: Significant Others can be merged with the Family sub-scale in a clinical sample and with the Friends sub-scale in a non-clinical sample. The characteristics of the groups used for the above-mentioned studies were as follows: for Stanley's study a group of 50 elderly people with generalized anxiety disorder was used, for Cheng and Chan (2004) and Chou (2000)'s studies a large sample of adolescents was used and for Wongpakaran and Wongpakaran's study, a group of 142 patients with major depression was used.

Method

Participants

A total of 486 participants, divided into two sample groups, were recruited for the study. The first group (named 'Group 1'), who volunteered for the study, consisted of 310 medical students studying in years one to five at the Faculty of Medicine, Chiang Mai University. In total 59% of this group was made up of females, aged 18 to 22 years old (M

= 19.16 years, $SD = 1.02$ years), and this group used the original version of the MSPSS.

The second group (named 'Group 2') used the revised version of the MSPSS and included 176 participants from the first year of the Faculty of Medicine, aged 18 to 23 years old ($M = 18.76$, $SD = .57$) - with 43.2% of the people in this group being male. This group completed the revised version of the MSPSS, the Rosenberg Self-Esteem Scale and the Beck Depression Inventory II.

Apparatus

The revised Multi-dimensional Scale of Perceived Social Support (the revised MSPSS)

The MSPSS consists of twelve items rated on a five-point Likert-type scale, with answers ranging from 'strongly disagree' (1) to 'strongly agree' (5). There are three sub-scales used by the scale: Significant Others (SO) (Items 1, 2, 5, and 10), Family (FA) (Items 3, 4, 8, and 11) and Friends (FR) (Items 6, 7, 9, and 12). The MSPSS has been shown to be psychometrically sound when used with diverse samples, revealing good internal reliability and test-retest reliability and robust factorial validity (Cecil, Stanley, Carrion, & Swann, 1995; Zimet et al., 1988). Likewise, the Thai version of the MSPSS has demonstrated good reliability and validity ($\alpha = .92$) (Wongpakaran & Wongpakaran, 2011).

In an attempt to help increase awareness when students responded to the revised questionnaire items, we added the sentence "*Note: special person excludes friends and family*" to the instructions, in order to warn the respondents to be aware of the existence of the SO sub-scale (see table 4).

Rosenberg Self-Esteem Scale (RSES)

The Rosenberg Self-Esteem Scale (Rosenberg, 1965) was also utilized to examine the convergent validity; a ten-item questionnaire, using a four-point Likert scale with answers ranging from 'strongly agree' to 'strongly disagree', and with higher scores associated with higher levels of self-esteem, one example being "On the whole, I am satisfied with myself." The Thai Self-Esteem Scale has revealed a good internal consistency ($\alpha = .87$) and concurrent validity with the adult attachment scale (Wongpakaran, Wongpakaran, & Wannarit, 2011).

Thai Depression Inventory (TDI)

The TDI, developed by Lotrakul and Sukanich, is an instrument that measures the severity of depression, consisting of twenty items and a four-point scale with answers ranging from 1 (*no symptoms*) to 4 (*mostly severe*). Higher scores are associated with stronger feelings of depression. The internal reliability and concurrent validity of this instrument when compared with other depressive measurements has been found to be satisfactory ($\alpha = .86$; $r = .72$). (Lotrakul & Sukanich, 1999)

Table 1
The revised-MSPSS

We are interested in learning about your feelings toward the following statements. Please read each statement carefully and indicate how you feel about it. (Note: "special" person excludes friends or family)

- Circle No. 1 if you strongly disagree
- Circle No. 2 if you disagree
- Circle No. 3 if you disagree only slightly
- Circle No. 4 if you feel neutral
- Circle No. 5 if you agree only slightly
- Circle No. 6 if you agree
- Circle No. 7 if you strongly agree.

1. Someone special is within reach when I need help.	1	2	3	4	5	6	7
2. Someone special is able to share my overwhelming happiness and grief.	1	2	3	4	5	6	7
3. My family really tries to help me.	1	2	3	4	5	6	7
4. I have received encouragement and moral support from my family when I needed it.	1	2	3	4	5	6	7
5. I have a special person who is the true source of my morale.	1	2	3	4	5	6	7
6. My friend has really tried to help me.	1	2	3	4	5	6	7
7. I can depend on my friend when failures happen.	1	2	3	4	5	6	7
8. I can tell my problems to my family.	1	2	3	4	5	6	7
9. I have a friend who can share my overwhelming happiness and grief.	1	2	3	4	5	6	7
10. There is a special person in my life who cares about my feelings.	1	2	3	4	5	6	7
11. My family is willing to help me make decisions.	1	2	3	4	5	6	7
12. I am able to tell my problems to my friend.	1	2	3	4	5	6	7

Data Analysis

Descriptive statistics were used for data screening and were found to be within acceptable parameters across both sample groups (that is, an acceptable reliability was found ($\alpha > .6$), and all items had a skewness and kurtosis of $< \pm 2$) (Kline, 1998). Any missing values were managed by replacing them with the series mean. Data screening was conducted for exploratory factor analysis (EFA), and the sampling adequacy was found to be good, with a Kaiser-Meyer-Olkin (KMO) value of 0.89 for Group 1 and 0.88 for Group 2. Bartlett's test of sphericity was also significant in both sample groups ($p < .001$) (Kaiser, 1958). The maximum likelihood method, with an oblique rotation, was performed on the items and for confirmatory factor analysis - without error terms correlated. To establish model fit indices, the following criteria were used: a Comparative Fit Index (CFI) of $\geq .95$, Non-Normed Fit Index (NFI) or Tucker-Lewis Index (TLI) values of $\geq .9$, a root-mean-square error of approximation (RMSEA) of $\leq .06$ - with values as high as $.08$ indicating a reasonable fit, a standardized root-mean-square residual (SRMR) of $\leq .08$ (Hu & Bentler, 1998, 1999, 1995) and the result of equation $\chi^2/df < 3$ (Kline, 1998). Modification indices were added to the model after the initial analysis, and a 'bootstrapping' procedure was applied to estimate how χ^2 would change when using a larger sample (Efron & Tibshirani, 1993). As recommended by Nevitt and Hancock (2000) Bollen-Stine

bootstraps were used. Internal consistency reliability was determined through calculation of Cronbach's alpha coefficient, whereby a reliability of more than $.70$ is acceptable (Nunnally & Bernstein, 1994). To assess the model fit, descriptive statistics and factor analysis were used to compare the results of Group 1 - using the original version of the MSPSS for a 310 student sample, with those of Group 2- using the revised version of the MSPSS for a 176 student sample. Factor analysis was carried out using the SPSS AMOS package version 18 (Arbuckle, 2009).

Results

Descriptive statistics

The mean total and sub-scale scores for Group 1 were not significantly different to those of Group 2, except for the SO sub-scale ($M \pm SD. = 5.62 \pm 1.04$ in Group 1 and 5.15 ± 1.40 in Group 2, $p < .0001$). No significant gender differences were found for the total and sub-scale scores in Group 1, whereas for Group 2 there were significantly higher total, FR and FA scores for females (5.80 ± 0.84 and 5.35 ± 1.01 ; 5.79 ± 0.90 and 5.38 ± 1.07 ; 6.36 ± 0.84 and 5.71 ± 1.13 , all $p < .01$) when using the revised version. No relationship between age and the total or sub-scale scores for the MSPSS used by both groups was found.

Table 1
Comparison of the factor loadings for the original and revised version

Item no.	FR		FA		SO	
	Original	revised	Original	revised	Original	revised
7	.91	.87				
6	.91	.87				
9	.84	.85				
12	.82	.81				
4			.89	.85		
11			.85	.79		
3			.82	.88		
8			.71	.69		
5					.83	.89
10					.81	.90
2					.77	.85
1					.70	.82
Eigenvalues	6.20	6.43	1.80	1.95	1.17	1.01
% variances	51.66	53.56	15.03	16.22	9.07	8.40
Mean (\pm SD)	5.56 \pm 1.07	5.15 \pm 1.40	6.25 \pm 0.91	6.08 \pm 1.03	5.57 \pm 1.06	5.15 \pm 1.40
Cronbach's alpha	.91	.91	.83	.88	.86	.92

Reliability

The internal consistency of the original MSPSS was good, with a Cronbach's alpha of .91; while for the sub-scales it was .91, .83 and .86 for FR, FA and SO respectively. In the revised version, the Cronbach's alpha was .92, and for the sub-scales it was .91, .88 and .92 for FR, FA and SO respectively (see Table 1).

Factor analysis

EFA yielded eigenvalues of 6.20, 1.80 and 1.17 for Group 1 - accounting for 51.66%, 15.03% and 9.71%, of the variance, and eigenvalues of 6.43, 1.95 and 1.01 for Group 2, accounting for 53.56%, 16.22%, and 8.40% of the variance. Factor loadings ranged from .70 to .91 in Group 1, and from .81 to .89 in Group 2. There was a high correlation between SO and FR in Group 1 ($r = .60, p < .0001$), whereas the correlation between SO was higher with FA than with FR in Group 2 ($r = .47, p < .0001$) (Table 3).

Table 2 shows that both two-factor model was clearly lacking in terms of fit; whereas, with regard to the three-factor model there was a close fit between the original and revised version, with the original version (Group 1) yielding: χ^2 198.66, df 51, $p < .001$; TLI .93; CFI .94; GFI .90; PNFI .71; AGFI .85; RMSEA .097 (.083 - .111); SRMR .046; AIC 252.66 and CAIC 380.52, and Group 2 yielding: χ^2 128.11, df 51, $p < .001$; TLI .94; CFI .95; GFI .90; PNFI .71; AGFI .85; RMSEA .093 (.073-.113); SRMR .042; AIC 182.11 and CAIC 294.72. Overall the level of fit was

acceptable for both versions, though the revised version tended to show a better fit, especially for AIC and CAIC which were smaller in the revised version than in the original. In addition, the Bollen-Stine bootstrap revealed that the model fit was better for the 1967 bootstrap samples. Testing the null hypothesis in order to show that the model was correct, the Bollen-Stine bootstrap $p = .017$.

Concurrent validity

As expected, the total scores for the revised version of the MSPSS, the RSES and TDI correlated significantly ($r = .44, p < .001$, and $r = -.31, p < .001$ respectively), plus there was a correlation between the sub-scales SO, FR and FA, and RSES which scored .32, .37 and .43 respectively, with $p < .001$ being found for all. In terms of a correlation between the TDI total score and the sub-scales SO, FR and FA, this came out as $-.24 (p < .001)$, $-.24 (p < .001)$, $-.21 (p < .005)$ and $-.16 (p < .05)$ respectively.

Discussion

Overall, the results show that the original version produced an acceptable fit, while the revised one appeared to be even better. All the fit indices for the revised version passed the relevant criteria when error terms were allowed to be correlated (this exception rule permitted because there was similar wording used among the sub-scales). Both versions provided moderate but acceptable PNFI levels, as long as the value was above 0.5 (Mulaik et al., 1989)

Table 2
 Comparison of the fit indices for the two and three-factor confirmatory models used by Group 1^a (the original version) and by Group 2 (the revised version)[‡]

Model	Version	Goodness of fit indices										Badness of fit indices				
		χ^2	df	χ^2/df	GFI	Absolute p	^b p	TLI	CFI	NFI	PNFI	AGFI	RMSEA (90%CI)	SRMR	AIC	CAIC
3-factor	Original ^a	198.66	51	3.90	0.90	.001	.001	0.93	0.94	0.93	0.71	0.85	0.097 (.08-.11)	0.046	252.66	380.55
	(correlated errors allowed)	120.54	44	2.74	0.94			0.96			0.89	0.89	0.078 (.061-.094)	0.034		
	Revised ^b	128.11	51	2.51	0.90	.001	.017	0.94	0.95	0.92	0.71	0.85	0.093 (.07-.11)	0.042	182.11	294.72
2-factor	Original	479.08	53	9.04	0.76	.001	.001	0.80	0.84	0.82	0.66	0.65	0.161 (.15-.18)	0.095	592.08	647.49
	Revised	519.59	54	9.6	0.62	.001	.001	0.64	0.71	0.68	0.56	0.45	0.222 (.21-.24)	0.314	566.59	666.69

Note. TLI = Tucker-Lewis Index; CFI = comparative fit index; AGFI = Adjusted GFI; RMSEA = root mean square error of approximation; SRMR = standardized root-mean-square residual; AIC = Akaike information criterion, CAIC = Consistent AIC; NFI = Normed Fit Index; PNFI = Parsimony Normed Fit Index.
^aN = 310. ^bN = 176. ^cN = 549. ^dN = 2103.
^bp = Bootstrap p-value

Table 3
Correlations between sub-scales when comparing the original and revised version

	Original ^a			Revised ^b		
	FR	FA	SO	FR	FA	SO
FR	1			1		
FA	.42**	1		.68**	1	
SO	.60**	.51**	1	.44**	.47**	1

Notes:

** Correlation is significant at the 0.01 level (two-tailed)

* Correlation is significant at the 0.05 level (two-tailed)

^a Variables' correlations in student group 1 ($n = 310$)

^b Variables' correlations in student group 2 ($n = 176$)

AIC and CAIC were used for model comparison – with the smaller the values given, the better the model. The revised version of the MSPSS proved to be preferable in this regard, and in terms of fit, using χ^2 we found that the revised version had a better χ^2/df than the original. According to Marsh, Balla, and McDonald (1988), when taking CFI and TLI into account, which are not impacted by sample size, the revised version also gave better values. We conducted a 'bootstrapping' procedure to estimate how the p -value would change if the sample size were to be increased, and after doing this, the revised version yielded a distinctively good fit, whereas there was almost no change for the original version ($p = .017$ vs. $p = .001$). This implies that if the revised version of the questionnaire were to be examined across a larger sample, it would yield a better result than it did in this study. When compared to the results produced by Clara et al. (2003), and Cheng and Chan (2004) - where correlated uniqueness was allowed, the revised version of MSPSS exhibited a better fit here than in those studies.

The reason why the revised version of MSPSS yielded a better model fit may be due to the fact that the revised version succeeds in helping the respondents to distinguish SO items from the rest. Correlation evidence showed that for the revised model there was a reduction in correlation coefficients between SO and the other sub-scales when compared to the original, indicating that SO tended to be treated as a separate entity - leading to increased reliability (an α of .92 in the revised version, as compared to .86 in the original) and providing the intended three-factor solution model. It would be interesting to see whether this phenomenon can be applied to other sample groups that have either similar (for example, a Chinese sample) or different cultural backgrounds.

Apart from the factor structure, the revised version of MSPSS demonstrated concurrent validity with other measures using this study's sample group. As expected, MSPSS was found to be positively correlated with the self-esteem score, but negatively correlated with the depression score. There was no age difference found in the total or

sub-scale scores for the revised version of MSPSS, a result which concurs with other studies (Canty-Mitchell & Zimet, 2000; Cheng & Chan, 2004). However, in the group of medical students using the revised version, female students reported more friend and family support than the male students, and this result is also supported by previous investigations (Canty-Mitchell & Zimet, 2000; Eker, Arkar, & Yaldiz, 2000; Zimet et al., 1988).

Some limitations in this study need to be addressed, including the relatively small size of the study sample, for, as determined by use of the 'bootstrap' method, a larger sample size is likely to more clearly reveal the impacts of the new version. In addition, there was a lack of test-retest reliability, and no measurement invariance test was conducted according to gender. Further investigations should be conducted using a variety of cultural backgrounds in terms of participants, as well as in various clinical environments, in order to test the robustness of the revised version.

Conclusion

In this study, the revised version demonstrated a more robust three-factor model construct- as hypothesized, providing a better level of reliability in terms of the overall scale and sub-scales than the original. Whether this result can be generalized and thus prevent indeterminable factor structure problems for other groups; for example, for clients with severe depression or for another particular clinical sample, or for those from different cultural backgrounds, still needs to be explored.

References

- Arbuckle, J. L. (2009). Amos (Version 18.0) Computer Program. Chicago, IL: SPSS.
- Beck, A. T., Steer, R. A., & Brown, G. K. (1996). *Manual for the Beck Depression Inventory-II*. San Antonio, TX: Psychological Corporation.
- Bruwer, B., Emsley, R., Kidd, M., Lochner, C., & Seedat, S. (2008). Psychometric properties of the Multidimensional Scale of Perceived Social Support in youth. *Comprehensive Psychiatry*, 49, 195–201. <http://dx.doi.org/10.1016/j.comppsy.2007.09.002>
- Canty-Mitchell, J., & Zimet, G. D. (2000). Psychometric properties of the Multidimensional Scale of Perceived Social Support in urban adolescents. *American Journal of Community Psychology*, 28, 391–400.
- Cecil, H., Stanley, M. A., Carrion, P. G., & Swann, A. (1995). Psychometric properties of the MSPSS and NOS in psychiatric outpatients. *Journal of Clinical Psychology*, 51, 593–602. [http://dx.doi.org/10.1002/1097-4679\(199509\)51:5<593::AID-JCLP2270510503>3.0.CO;2-W](http://dx.doi.org/10.1002/1097-4679(199509)51:5<593::AID-JCLP2270510503>3.0.CO;2-W)
- Cheng, S-T., & Chan, A .C. M. (2004). The multidimensional scale of perceived social support: Dimensionality and age and gender

- differences in adolescents. *Personality and Individual Differences*, 37, 1359–1369. <http://dx.doi.org/10.1016/j.paid.2004.01.006>
- Chou, K.-L. (2000). Assessing Chinese adolescents' social support: The multidimensional scale of perceived social support. *Personality and Individual Differences*, 28, 299–307. [http://dx.doi.org/10.1016/S0191-8869\(99\)00098-7](http://dx.doi.org/10.1016/S0191-8869(99)00098-7)
- Clara, I. P., Cox, B. J., Enns, M. W., Murray, L. T., & Torgrude, L. J. (2003). Confirmatory factor analysis of the multidimensional scale of perceived social support in clinically distressed and student samples. *Journal of Personality Assessment*, 81, 265–270. http://dx.doi.org/10.1207/S15327752JPA8103_09
- Dahlem, N. W., Zimet, G. D., & Walker, R. R. (1991). The Multidimensional Scale of Perceived Social Support: A confirmation study. *Journal of Clinical Psychology*, 47, 756–761. [http://dx.doi.org/10.1002/1097-4679\(199111\)47:6<756::AID-JCLP2270470605>3.0.CO;2-L](http://dx.doi.org/10.1002/1097-4679(199111)47:6<756::AID-JCLP2270470605>3.0.CO;2-L)
- Efron, B., & Tibshirani, R. (Eds.). (1993). *An introduction to the bootstrap*. New York, NY: Chapman and Hall.
- Ege, E., Timur, S., Zincir, H., Geçkil, E., & Sunar-Reeder, B. (2008). Social support and symptoms of postpartum depression among new mothers in Eastern Turkey. *Journal of Obstetrics and Gynaecology Research*, 34, 585–593. <http://dx.doi.org/10.1111/j.1447-0756.2008.00718.x>
- Eker, D., Arkar, H., & Yaldiz, H. (2000). Generality of support sources and psychometric properties of a scale of perceived social support in Turkey. *Social Psychiatry and Psychiatric Epidemiology*, 35, 228–233.
- Frasere-Smith, N., Lespérance, F., Gravel, G., Masson, A., Juneau, M., Talajic, M., & Bourassa, M. G. (2000). Social support, depression, and mortality during the first year after myocardial infarction. *Circulation*, 101, 1919–1924. <http://dx.doi.org/10.1161/01.CIR.101.16.1919>
- Hu, L., & Bentler, P. M. (1998). Fit indices in covariance structure modeling: Sensitivity to under parameterized model misspecification. *Psychological Methods*, 3, 424–453.
- Hu, L., & Bentler, P. M. (1999). Cut off criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, 6, 1–55.
- Hu, L., & Bentler, P. M. (Eds.). (1995). *Evaluating model fit. In Structural Equation Modeling: Concepts, Issues and Applications*. Newbury Park, CA: Sage.
- Kaiser, H. F. (1958). The varimax criterion for analytic rotation in factor analysis. *Psychometrika*, 23, 187–200. <http://dx.doi.org/10.1007/BF02289233>
- Kline, R. B. (1998). *Principles and practice of structural equation modeling*. New York, NY: Guilford.
- Lotrakul, M., & Sukanich, P. (1999). Development of the Thai Depression Inventory. *Journal of Medical Association of Thailand*, 82, 1200–1207.
- Marsh, H. W., Balla, R., & McDonald, R. P. (1988). Goodness-of-fit indices in confirmatory factor analysis: The effect of sample size. *Psychological Bulletin*, 103, 391–410. <http://dx.doi.org/10.1037//0033-2909.103.3.391>
- Mulaik, S. A., James, L. R., Van Alstine, J., Bennett, N., Lind, S., & Stilwell, C. D. (1989). Evaluation of goodness-of-fit indices for structural equation models. *Psychological Bulletin*, 105, 430–445. <http://dx.doi.org/10.1037//0033-2909.105.3.430>
- Nevitt, J., & Hancock, G. R. (2001). Performance of bootstrapping approaches to model test statistics and parameter standard error estimation in structural equation modeling. *Structural Equation Modeling: A Multidisciplinary Journal*, 8, 353–377. http://dx.doi.org/10.1207/S15328007SEM0803_2
- Nunnally, J. C., & Bernstein, I. R. (1994). *Psychometric theory*. New York, NY: McGraw-Hill Book Company.
- Pedersen, S. S., Spinder, H., Erdman, R. A., & Denollet, J. (2009). Poor perceived social support in implantable cardioverter defibrillator (ICD) patients and their partners: Cross-validation of the multidimensional scale of perceived social support. *Psychosomatics*, 50, 461–467. <http://dx.doi.org/10.1176/appi.psy.50.5.461>
- Ramaswamy, V., Aroian, K. J., & Templin, T. (2009). Adaptation and psychometric evaluation of the multidimensional scale of perceived social support for Arab American adolescents. *American Journal of Community Psychology*, 43(1-2), 49–56. <http://dx.doi.org/10.1007/s10464-008-9220-x>
- Rosenberg, M. (1965). *Society and the Adolescent Self-Image*. Princeton, NJ: Princeton University Press.
- Stanley, M. A., Beck, J. G., & Zebb, B. J. (1998). Psychometric properties of the MSPSS in older adults. *Aging & Mental Health*, 2, 186–193. <http://dx.doi.org/10.1080/13607869856669>
- Vaingankar, J. A., Abdin, E., & Chong, S. A. (2012). Exploratory and confirmatory factor analyses of the Multidimensional Scale of Perceived Social Support in patients with schizophrenia. *Comprehensive Psychiatry*, 53, 286–291. <http://dx.doi.org/10.1016/j.comppsy.2011.04.005>
- Wongpakaran, T., Wongpakaran, N., & Ruktrakul, R. (2011). Reliability and validity of the Multidimensional Scale of Perceived Social Support (MSPSS): Thai version. *Clinical Practice & Epidemiology in Mental Health*, 7, 161–166. <http://dx.doi.org/10.2174/1745017901107010161>
- Wongpakaran, T., Wongpakaran, N., & Wannarit, K. (2011). Validity and reliability of the Thai version of the Experiences of Close Relationships-Revised Questionnaire. *Singapore Medical Journal*, 52, 100–106.
- Zimet, G. D., Dahlem, N. W., Zimet, S. G., & Farley, G. K. (1988). The Multidimensional Scale of Perceived Social Support. *Journal of Personality Assessment*, 52, 30–41. http://dx.doi.org/10.1207/s15327752jpa5201_2
- Zimet, G. D., Powell, S. S., Farley, G. K., Werkman, S., & Berkoff, K. A. (1990). Psychometric characteristics of the Multidimensional Scale of Perceived Social Support. *Journal of Personality Assessment*, 55, 610–617. <http://dx.doi.org/10.1080/00223891.1990.9674095>

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