

## FACTOR STRUCTURE OF THE ARABIC VERSION OF THE UCLA LONELINESS SCALE

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### ABSTRACT

The practice of combining both positively and negatively worded statements on a scale is one of the suggested means of reducing acquiescence bias. The literature, however showed mixed results with regard to the outcomes of this practice and called for further validation studies. Based on these premises, this study examined the item wording effect on the factor structure of the Arabic version of the UCLA Loneliness Scale. The participants included samples from six populations in the United Arab Emirates who were differentiated into groups according to sex, age, and marital status. Exploratory Factor Analysis (EFA) was used to determine the underlying structure of the scale and Confirmatory Factor Analysis (CFA) was used to ascertain the validity of the outcomes. The internal reliability of the scale was confirmed in all the three groups of participants and the results showed that the scale reflected two main factors clearly divided by positively and negatively worded items. To avoid the effect of distorting the structure on account of item wording, it is incumbent on the designer of a scale to prudently determine the necessity of using negatively worded items in consideration of the context of the research and the evaluation setting.

**KEYWORDS:** Factor Structure, Loneliness Scale, Negative Item Wording, Positive Item Wording

### INTRODUCTION

The inclusion of both positively and negatively worded items in psychological scales tends to encourage respondents to read questions carefully and provide meaningful responses, thus reducing response bias (Schriesheim & Eisenbach, 1995; Sauro & Lewis, 2011). This is because; people sometimes tend to agree with statements without regard to their actual contents. Hence, the inclusion of negative statements reduces the rate of response and promotes cognitive reasoning. A combination of positive and negative statements, also contributes to greater validity (Salazar, 2015).

Recent research, however, indicates that this practice introduces a new source of variation and confounds the factor structure of scales (Barnette, 2000; Pilotte & Gable, 1990; Sauro & Lewis, 2011; Schmitt & Stuits, 1985). The literature contains several examples of how both positively and negatively worded items change scale factor structure. For example, several studies of the Rosenberg Self-Esteem Scale and the Hospital Anxiety & Depression Scale show method effects or response style associated with negativity and/or positively worded items on these two scales (Greenberger, Chen, Dmitrieva, & Farruggia, 2003; Wouters, Booyesen, Ponnet, & Van Loon, 2012; Ye, 2009). A study that examined the effect of using reversed worded items together with positive items using the Need for Cognition Scale (NFC) showed that the number and type of reversed worded items affected the factor structure of the scale used (Zhang, Noor, & Savalel, 2016) Therefore, it has been recommended to conduct additional research to examine possible wording

effects in psychological scales especially the common ones that used by different cultures and populations (DiStefano & Motl, 2006; Tomas & Oliver, 1999).

The UCLA loneliness scale (Version 3) (Russell, 1996) is a well-established measure translated into many languages and cultures (e.g., French, German, Greek, Japanese, Persian, Portuguese, Russian, Spanish, and Arabic) (Perlman & Peplau, 1998). This self-report scale consists of 9 positively worded items and 11 negatively worded items distributed randomly within the scale. The use of direct questions (e.g., "Lonely" or "loneliness") to measure loneliness may result in underreporting (Gierveld, Tilburg, & Dykstra, 2006). Therefore, the UCLA's items describe the experience of loneliness and avoid direct references to the term. The scale avoids statements that the general public may attribute to loneliness by using terms consistent with a theoretically defined understanding of loneliness (Lasgaard, 2007).

The UCLA Scale presents problems regarding its factor structure (Austin, 1983; Hawkey, Browne, Cacioppo, 2005; Knight, Chisholm, Marsh, & Godfrey, 1988; Mahon, Yarcheski, & Yarcheski, 1995; McWhirter, 1990; Soo, 1997). Some researchers present the scale as unidimensional, but include the method effects in the items that are positively worded, while others include the method effects in the negatively worded items. Previous psychometric studies of the UCLA scale also reported that positively and negatively worded items from two factors instead of a single one. For example, the factor structure of the UCLA with a Korean population found three factors. The negatively worded items loaded on one factor while the positively worded items, split between two other factors (Soo, 1997). Hawkey, et al., (2005) supported both a two-and a three-factor solution, with a three-factor solution seemingly optimal. In this study, the negatively worded items loaded on the first factor and the positively worded items loaded in the second and third factors. The study concluded that, the UCLA scale has three distinct loneliness facets and that wording bias is not solely responsible for the scales' multiple factor structure.

The other important point is that, the factor structure of the UCLA scale was found to be varied across different populations (e.g., College students, nurses, teachers, and elderly) (Russell, 1996). Research showed that some variables (e.g., Gender, age, and marital status) significantly affect loneliness (Kowalski & Bondmass, 2008, Mahon, Yarcheski, Yarcheski, Cannella, & Hanks, 2006; Perlman & Peplau, 1998; Pinquart & Sorensen, 2001; Victor, Grenade, & Boldy, 2005).

In consideration of the foregoing premises, this study examined the effect of item wording on the factor structure of the Arabic version of the UCLA Loneliness Scale (Daswqee, 1998) based on a sample extracted from six populations in the United Arab Emirates.

## **METHOD**

### **Participants**

A total of 2374 individuals participated in the study by responding to the UCLA Loneliness Scale including information of the demographic variables. Students from the UAE University recruited the participants from six populations based on the three variables of the study: teenagers and elderly based on age; males and females based on gender; and married and unmarried based on marital status. Data were collected using the survey.

### **Instrument**

The Arabic version of the UCLA Loneliness Scale (Version 3; Russell, 1996) adapted by Daswqee (1998) was

used in this study. The UCLA is a 20 item Likert-type scale in which responses range from 1 (never) to 4 (always). The scale includes 9 positively worded items (1, 5, 6, 9, 10, 15, 16, 19, and 20) and 11 negatively worded items (2, 3, 4, 7, 8, 11, 12, 13, 14, 17, and 18) randomly distributed throughout the scale. Positively worded items score-reversed so higher total values indicate greater feelings of loneliness with a score range from 20 to 80. The scale's reliability was found to be high with alpha coefficients ranging between .89 to .94 for samples of students, nurses, teachers, and elderly (Russell, 1996). Test-retest reliability in adult samples was likewise high (.73). The scale's criterion-related validity was supported by strong correlations with other measures of loneliness such as the NYU Loneliness Scale and the Differential Loneliness Scale (Russell, 1996).

### Procedure

Exploratory Factor Analysis (EFA) was conducted first to find out the underlying structure of the UCLA loneliness scale. An exploratory sample of 971 participants was used in this analysis. The initial structure of the scale obtained from the EFA was then validated using Confirmatory Factor Analysis (CFA). This procedure was conducted separately for each of the six samples (a total of 1403 participants) based on the three study variables (age, gender, and marital status).

## RESULTS AND DISCUSSION

Data were screened for outliers or extreme values prior to conducting a statistical analysis. Accordingly, no outliers or extreme values were found. Demographic characteristics of participants in the exploratory sample as well as in the six other samples are shown in Table 1. The exploratory sample had more females (61.1%) than males and the average age of all participants was 27.8 years. The age group consisted of two samples, namely teenagers and elderly. The average age of the teenagers was about 17 years while the average age of the elderly group was above 65 years. In terms of sex, age averages of males and females were very close (around 20 years). With regards to marital status, married individuals were more than the unmarried ones. The average age of married persons (39.6 years) was bigger than that of the unmarried individuals (32.6 years).

**Table 1: Demographic Characteristics of the Participants**

Exploratory Sample		Total	Males (n (%))	Females (n (%))	Age (mean (SD))	
		971	365 (37.6%)	593 (61.1%)	27.9 (13.4)	
Age		Total	Males (n (%))	Females (n (%))	Age (mean (SD))	
		Teenagers	259	84 (32.4%)	171 (66.0%)	16.8 (1.5)
		Elderly	169	102 (60.4%)	64 (37.9%)	65.9 (3.6)
		Total	Age (mean (SD))			
Gender		Males	20.1 (1.7)			
		Females	20.3 (1.7)			
		Total	Males (n (%))	Females (n (%))	Age (mean (SD))	
Marital Status		Married	249	96 (38.6%)	153 (61.4%)	39.6 (5.3)
		Unmarried	196	84 (42.9%)	106 (54.1%)	32.6 (4.7)

The initial analysis involved determining the means and standard deviations of each of the 20 items of the scale using the exploratory sample. Table 2 shows that, item 8 (how often do you feel that your interests and ideas are not shared by those around you?) had the maximum mean value. The minimum mean value has been on item 9 (how often do you feel that you feel outgoing and friendly?). The standard deviation values of the 20 items were close and ranged from .74 to .96.

The scale used to be internally reliable based on this sample, as Cronbach's alpha value was .89.

**Table 2: Means and Standard Deviations of the Items of the UCLA Scale for the Exploratory Sample**

No	Item	Mean	SD
1	"In tune" with the people around you?	1.75	.74
2	Lack companionship?	2.33	.89
3	No one you can turn to?	2.31	.91
4	You feel alone?	2.16	.93
5	You are part of a group of friends?	1.76	.88
6	A lot in common with people around	2.06	.82
7	You are no longer close to anyone?	2.24	.93
8	Your interests are not shared by others	2.57	.81
9	You feel outgoing and friendly?	1.71	.81
10	Feel close to people?	1.85	.78
11	You feel left out?	1.84	.87
12	Relationships are not meaningful?	1.95	.90
13	No one really knows you well?	2.44	.87
14	You feel isolated from others?	2.15	.93
15	Find companionship when you want it?	2.07	.89
16	People who really understand you?	2.17	.84
17	You feel shy?	2.48	.96
18	People not with you?	2.49	.89
19	There are people you can talk to?	1.91	.85
20	There are people you can turn to?	1.99	.85
	Total Score	42.23	9.80

### Exploratory Factor Analysis

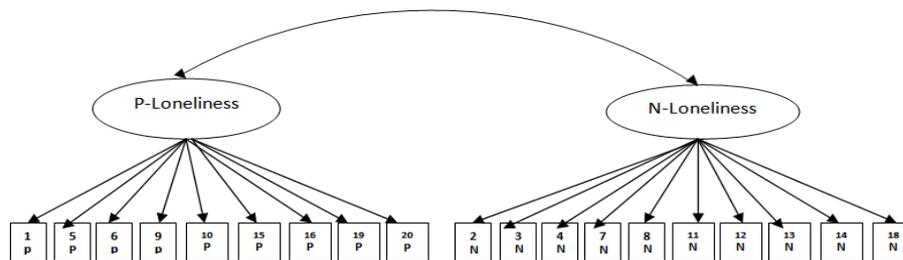
The exploratory sample was used to examine the factor structure of the UCLA loneliness scale through conducting EFA using Principal Axis Factoring (PAF) with (oblique) rotation method. Oblique rotation was applied because high correlation values were observed between the extracted factors. In addition, the extracted factors are expected to be correlated given the fact that they all are items from the same scale and supposed to measure one construct (loneliness). To assess the appropriateness of factor analysis for this data set, the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett's test of Sphericity were examined. KMO varies between 0 and 1 and values closer to 1 are better. The value of the KMO for this data set was .93 which indicates an acceptable level. The Bartlett's test of Sphericity tests the null hypothesis that the correlation matrix is an identity matrix. The values of Bartlett's test for this data set were all significant ( $p < .001$ ) resulting in the rejection of the null hypothesis. Accordingly, the data were found to be appropriate for conducting EFA. Table 3 shows the results of this analysis which includes the extracted factors, the items loaded on each factor and the loading values (only loadings above .50 was presented).

**Table 3: Factors, Items Loaded on each Factor, and Loading Values of the 20 Items of the UCLA Scale**

No	Item/direction	Factor 1	Factor 2
1	"In tune" with the people around you? (+)	.57	
2	Lack companionship? (-)		.55
3	No one you can turn to? (-)		.60
4	You feel alone? (-)		.69
5	You are part of a group of friends? (+)	.54	
6	A lot in common with people around? (+)	.52	
7	You are no longer close to anyone? (-)		.66

Item	Item Description	Factor 1 Loading	Factor 2 Loading
8	Your interests are not shared by others? (-)		.50
9	You feel outgoing and friendly? (+)	.58	
10	Feel close to people? (+)	.67	
11	You feel left out? (-)		.59
12	Relationships are not meaningful? (-)		.58
13	No one really knows you well? (-)		.62
14	You feel isolated from others? (-)		.72
15	Find companionship when you want it? (+)	.52	
16	People who really understand you? (+)	.65	
17	You feel shy? (-)	.15	.27
18	People not with you? (-)		.60
19	There are people you can talk to? (+)	.59	
20	There are people you can turn to? (+)	.63	

Accordingly, Table 3 shows that two factors were extracted from the 20 items of the scale. The nine positively worded items were loaded on the first factor. As for the negatively worded items, 10 out of 11 loaded on the second factor. This means that this scale showed two main factors clearly divided by positively and negatively worded items. Item 17 (how often do you feel shy?), however, was the only item that did not load on any factor. Its loading values were .15 and .27 on the first (positive) and second (negative) factor respectively. It appears that this item is functioning differently compared to all other items in the scale. Figure 1 presents graphically the correlated two factors that were resulted from the EFA of the UCLA scale.



**Figure 1: The two-factor solution of the UCLA Loneliness Scale**

Note P: Positively worded item, N: Negatively worded item, Item 17 removed.

### Confirmatory Factor Analysis

To confirm the EFA results obtained above of the factor structure of the UCLA scale, a Confirmatory Factor Analysis (CFA) was conducted on each of the six samples in the study. Starting with the age groups, the means and standard deviations of the items of the scale for the two age groups (teenagers and elderly) were calculated and presented in Table 4. In the teenager group, the highest mean value (3.15) was for item 20 (how often do you feel that there are people you can turn to?) while the lowest value (1.61) was for item 5 (how often do you feel part of a group of friends?). For the elderly group, the highest value (3.12) was also for item 20, while the lowest value (1.58) was for item 9 (how often you feel outgoing and friendly?). On the whole, the mean for the teenager's group (42.20) was a little bit higher than the theoretical mean value of the scale (40). Similar results were observed for the elderly group with an overall mean of (43.68). The UCLA scale was internally reliable on both groups as Cronbach's alpha was .84 for the teenager's and .88 for elderly group.

The other analysis which was conducted on the distribution of the values of the scale items was for assessing the normality assumption through finding the values of skewness and kurtosis. Normality is a required assumption for the maximum likelihood estimate which is used by CFA. As shown in Table 4, all skewness values (except two items) were between -1 and +1 indicating that the distributions were close to symmetrical (Bulmer, 1979). Similar results were observed for kurtosis values.

**Table 4: Mean, Standard Deviation, Skewness, and Kurtosis of the Items of the UCLA Scale for the Age Samples**

No	Item	Teenagers				Elderly			
		Mean	SD	Skew	Kurt	Mean	SD	Skew	Kurt
1	"In tune" with the people around you?	1.72	.66	.70	.81	1.80	.80	.81	.20
2	Lack companionship?	2.21	.88	.12	-.86	2.63	.91	-.19	-.74
3	No one you can turn to?	2.16	.97	.30	-.97	2.34	.92	.19	-.77
4	You feel alone?	2.02	.93	.44	-.86	2.28	.98	.03	-1.14
5	You are part of a group of friends?	1.61	.84	1.25	.71	2.08	.98	.46	-.86
6	A lot in common with people around	2.02	.77	.34	-.38	2.22	.90	.34	-.61
7	You are no longer close to anyone?	2.13	.87	.34	-.61	2.20	.96	.42	-.74
8	Your interests are not shared by others	2.53	.78	.04	-.40	2.67	.87	-.17	-.64
9	You feel outgoing and friendly?	1.67	.79	1.01	.37	1.58	.84	1.35	.95
10	Feel close to people?	1.85	.78	.67	.07	1.76	.82	.81	-.90
11	You feel left out?	1.86	.91	.83	-.16	1.90	.92	.62	-.66
12	Relationships are not meaningful?	1.88	.86	.63	-.46	2.03	.94	.50	-.73
13	No one really knows you well?	2.42	.89	-.06	-.78	2.46	.91	.08	-.78
14	You feel isolated from others?	2.01	.97	.52	-.85	2.21	1.07	.21	-1.29
15	Find companionship when you want it?	2.00	.97	.61	-.67	2.17	.97	.30	-.97
16	People who really understand you?	2.11	.84	.40	-.40	2.15	.83	.23	-.56
17	You feel shy?	2.68	.90	-.23	-.68	2.11	1.0	.36	-1.11
18	People not with you?	2.48	.88	-.08	-.70	2.42	.88	.13	-.67
19	There are people you can talk to?	1.78	.87	.95	.14	1.72	.82	.82	-.24
20	There are people you can turn to?	3.15	.95	-.87	-.25	3.12	.92	-.66	-.62
	Total Score	42.28	9.0	.63	.59	43.68	10.01	.35	-.53

A similar analysis was conducted for both sexes. The means and standard deviations of the items of the scale for males and females are shown in Table 5. Among males, the highest mean value (2.40) was for item 8 (how often do you feel that your interests and ideas are not shared by those around you?), while the lowest value (1.64) was for item 5 (how often do you feel part of a group of friends?). For females, the highest value (2.70) was for item 17 (how often do you feel shy?). The lowest value (1.74) was for item 5 which was similar to those of males. The overall average of the scale for the males (39.43) was a little bit less than the theoretical mean of the scale which is 40. In comparison to the males, a large difference was observed among females. The overall mean of the scale items for females were 45.44 which were much bigger than that of the males (39.16). This means that lonely feelings are considerably different between males and females as females show more lonely feelings than males. The UCLA scale was internally reliable in both groups as Cronbach's alpha was .90 for the males and .88 for the females. Regarding skewness and kurtosis, all values were between -1 and +1 except two items. This means that the assumption of normality was also met in both groups.

**Table 5: Mean, Standard Deviation, Skewness, and Kurtosis of the Items of the UCLA Scale According to Sex**

No	Item	Females				Males			
		Mean	SD	Skew.	Kurt.	Mean	SD	Skew.	Kurt.
1	“In tune” with the people around you?	1.82	.62	.62	1.66	1.75	.72	.83	.75
2	Lack companionship?	2.46	.85	-.20	-.64	2.04	.89	.26	-1.02
3	No one you can turn to?	2.44	.84	-.03	-.60	2.08	.96	.41	-.88
4	You feel alone?	2.33	.92	.01	-.92	1.83	.91	.79	-.40
5	You are part of a group of friends?	1.74	.78	.90	.36	1.64	.86	1.22	.61
6	A lot in common with people around	2.12	.72	.36	.10	2.00	.80	.61	.12
7	You are no longer close to anyone?	2.56	.88	-.07-	-.68	1.93	.89	.56	-.67
8	Your interests are not shared by others	2.66	.68	-.29-	.05	2.40	.92	-.01	-.86-
9	You feel outgoing and friendly?	1.84	.74	.67	.37	1.70	.82	1.10	.75
10	Feel close to people?	2.00	.70	.47	.41	1.79	.83	.89	.26
11	You feel left out?	1.92	.85	.45	-.78	1.75	.83	.82	-.21
12	Relationships are not meaningful?	1.99	.84	.41	-.64	1.91	.95	.74	-.49
13	No one really knows you well?	2.65	.84	-.16	-.54	2.31	.96	.14	-.97
14	You feel isolated from others?	2.34	.86	.08	-.67	1.99	.90	.45	-.80
15	Find companionship when you want it?	2.21	.82	.30	-.40	1.88	.85	.68	-.25
16	People who really understand you?	2.40	.72	.28	-.12	2.07	.86	.43	-.46
17	You feel shy?	2.70	.86	-.25	-.55	2.19	.94	.24	-.91
18	People not with you?	2.69	.76	-.15	-.31	2.15	.92	.31	-.79
19	There are people you can talk to?	2.07	.68	.21	-.11	1.84	.81	.69	-.12
20	There are people you can turn to?	2.33	.55	1.12	.67	1.93	.86	.60	-.39
Total Score		45.26	8.62	.51	.55	39.16	10.32	.18	-.45

Finally, the same analysis was conducted based on marital status groups (married and unmarried). The means and standard deviations of the Scale items for the two groups are shown in Table 6. As for the married individuals, the highest mean value (3.23) was for item 20 (how often do you feel that there are people you can turn on?), while the lowest mean value (1.63) was for item 9 (how often you feel outgoing and friendly?). For the unmarried group, the highest value was on item 20, while the lowest value was for item 1 (how often do you feel that you are “in tune” with people around you?). The overall mean for the group of married individuals was 42.03, which was less than that of the group of unmarried persons (43.31). On the whole, the scale was reliable as indicated by Cronbach’s alpha (.87) which was the same for both groups. With respect to the normality assumption, it can be observed from Table 6 that all values of skewness and kurtosis were between -1 and +1 except two items. This means that the distribution of the values of the scale items is close to the normal distribution in both groups.

**Table 6: Mean, Standard Deviation, Skewness, and Kurtosis of the Items of the UCLA Scale according to Marital Status**

No	Item	Married				Unmarried			
		Mean	SD	Skew	Kurt	Mean	SD	Skew	Kurt
1	“In tune” with the people around you?	1.68	.75	1.07	1.04	1.73	.78	1.04	.94
2	Lack companionship?	2.31	.90	-.01	-.89	2.35	.82	-.11	-.68
3	No one you can turn to?	2.29	.91	.03	-.94	2.33	.88	-.11	-.87
4	You feel alone?	2.08	.95	.41	-.88	2.20	.94	.25	-.91
5	You are part of a group of friends?	1.79	.97	1.09	.14	1.74	.84	.94	.15
6	a lot in common with people around	2.00	.83	.52	-.29	2.10	.88	.35	-.66
7	You are no longer close to anyone?	2.17	.90	.26	-.77	2.20	.90	.35	-.61
8	Your interests are not shared by others	2.62	.81	-.45	-.25	2.56	.76	-.35	-.22
9	you feel outgoing and friendly?	1.63	.79	1.16	.76	1.75	.84	.98	.35
10	Feel close to people?	1.75	.80	.92	.36	1.83	.77	.86	.75
11	You feel left out?	1.73	.90	.95	-.15	1.89	.88	.77	-.14
12	Relationships are not meaningful?	1.93	.94	.58	-.76	1.96	.91	.62	-.45
13	No one really knows you well?	2.22	.90	.16	-.83	2.49	.81	-.04	-.48
14	You feel isolated from others?	2.05	.93	.41	-.86	2.19	.90	.34	-.66
15	Find companionship when you want it?	2.04	.88	.41	-.66	2.15	.91	.27	-.83
16	People who really understand you?	1.95	.76	.42	-.25	2.11	.82	.35	-.41
17	You feel shy?	2.29	.92	.05	-.93	2.39	.93	.00	-.87
18	People not with you?	2.47	.92	-.05	-.82	2.45	.90	-.02	-.75
19	There are people you can talk to?	1.80	.83	.73	-.29	1.94	.85	.63	-.21
20	There are people you can turn to?	3.23	.85	-.93	.18	3.06	.87	-.59	-.41
	Total score	42.03	9.40	.07	-1.00	43.31	9.24	.32	.46

Confirmatory factor analysis was conducted to validate the two-factor solution obtained from the EFA. The model fit was examined and assessed using several fit indices. Two fit indices commonly used in research were selected to measure the fit of the tested models. These indices were the Non-Normed Fit Index (NNFI) and the Comparative Fit Index (CFI). Values of NNFI and CFI range between 0 and 1, with a value equal to or higher than .90, indicating good fit (Bentler, 1999; Byrne, 2010). In addition, the Standardized Root Mean Square Residual (SRMR) and the Root Mean Square Error of Approximation (RMSEA) were used. Values of SRMR and RMSEA below .08 show a good fit (Hu & Bentler, 1998; MacCallum, Browne, & Sugawara, 1996). The results (fit indexes values) of this analysis are presented in Table 7.

**Table 7: Goodness-of-fit Indices of the two-Factor Solution of the UCLA Scale for the Six Samples**

Sample	Fit Index			
	NNFI	CFI	SRMR	RMSEA
Teenagers	.95	.96	.06	.07
Elderly	.97	.97	.06	.06
Males	.97	.97	.05	.06
Females	.94	.95	.06	.07
Married	.96	.97	.06	.06
Unmarried	.96	.97	.06	.07

As it can be observed in the six samples that fit indices values were very close and data fit very well the two-factor solution of the UCLA loneliness scale.

## DISCUSSIONS

The results of the study showed that the factor structure of the UCLA loneliness scale forms two factors instead of a single one. These two correlated factors were initially extracted from EFA but also confirmed through the application of CFA. Additionally, the two-factor solution of the UCLA scale was assessed on six different groups/populations based on age, gender, and marital status of participants. The same result was validated in all these groups/populations. The factor structure of the UCLA observed in this study confirmed the results of previous studies which reported the existence of more than one factor in the scale. For example, Knight, et al., (1988), Lasgaard, (2007), Mahon, et al., (1995), and Soo, (1997) reported two-factor solution while Austin, (1983) and McWhirter, (1990) reported three-factor solution of the UCLA loneliness scale.

The two-factor model extracted in the UCLA represents the direction of item wording. Specifically, the 10 negatively worded items highly loaded on only one factor while the 9 positively worded items highly loaded only on the other one. All other items loadings were less than the cutoff point (.50). This means that the rating of this scale was affected by a response style related to the item wording. This response style could happen when individuals responded differently to positively and negatively worded items (Wouters, et al, 2012). Or it could happen when individuals give an inappropriate response to negatively worded items (Marsh, 1986). This inappropriate response to negatively worded items could be the reason for the existence of factors associated with item wording (Forsterlee & Ho, 1999). Additionally, data fit very well the two-factor solution of the UCLA loneliness scale in the six different groups/populations which indicates that this response style was not confounded by variables such as age, gender, and marital status. Russell (1996) reported different result where the underlying construct of the loneliness scale varies across different groups (e.g., college students, nurses, teachers, and elderly).

The study also supports other studies that question the inclusion of positively and negatively worded items in psychological questionnaires and scales (Barnette, 2000; Pilotte & Gable, 1990; Sauro & Lewis, 2011; Schmitt & Stuits, 1985). According to these studies, this practice affects negatively on the scale by distorting its factor structure. It has been recommended in this regard that “the survey or questionnaire designer must determine if using negatively worded items or other alternatives are needed in the context of the research or evaluation setting. As recommended, “unless there are some pervasive and unambiguous reasons for not doing so, it is probably best for all items to be positively or directly worded and not mixed with negatively worded items” (Barnette, 2000, p. 362).

Practical alternatives have been suggested to deal with including positively and negatively worded items in psychological scales. For example, instead of mixing the item phrasing, the response options could be reversed or, sum scores could only include the positively worded items (Wouters, et. al., 2012). Barnette (2000) suggested the use of the mixed response options rather than the mixed item stems. That is, using positively worded items in combination with half of the response sets going from strongly disagree to strongly agree and the other half going from strongly agree to strongly disagree.

Finally, an interesting result was observed for Item # 17 (how often do you feel shy?). This item did not load on

any factor which indicates that it is functioning differently than all other items in the scale. A similar result about item # 17 was also reported by Lasgaard (2007). A careful examination of this item suggests that it could be culturally biased. Shyness, as assumed by this item in the UCLA loneliness scale, is negative and supposed to indicate feeling lonely. However, shyness in some other cultures is different as it means something positive and does not indicate loneliness. It seems that this item is interpreted differently in different cultures or backgrounds and thus should be removed from the scale when applied in these cultures.

## CONCLUSIONS

We conclude that there are an item wording effects on the factor structure of the UCLA scale and cultural influence can also influence how some items are perceived. Therefore, it would be prudent for those who are adopting and translating the UCLA to consider the semantic contextualization of the worded items in the scale against the linguistic and cultural background of the intended respondents.

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