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ORIGINAL ARTICLE

Acculturation and manifestation of depressive symptoms among Korean-American older adults

Y. JANG[1], G. KIM[2], & D. CHIRIBOGA[1]

[1]*Department of Aging and Mental Health, and* [2]*School of Aging Studies, University of South Florida, Tampa, Florida, USA.*

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Abstract
The present study examined the role of acculturation in manifestation of depressive symptoms among 230 Korean-American older adults (M age = 69.8, SD = 7.05) in Florida. Given the cultural emphasis on modesty and self-effacement in the traditional Korean society, we hypothesized that older Korean-Americans who were less acculturated to American culture, when compared to the more acculturated ones, would be more likely to inhibit positive affects in depressive symptom reports. Using two validated measures of depressive symptoms, the short forms of the Geriatric Depression Scale (GDS-SF) and the Center for Epidemiologic Studies-Depression Scale (CES-D), different response patterns for low and high acculturation groups were identified. First, there was low comparability in the factor structures for both the GDS-SF and the CES-D across low and high acculturation groups. A differential item function (DIF) analysis based on partial correlations indicated that older adults in the low acculturation group inhibited endorsing positive affect items; one item in the GDS-SF (#7 'feel happy') and two items in the CES-D (# 5 'felt hopeful' and # 8 'was happy'). The finding suggests the substantial cultural influences in expressing emotions, especially those related to positive affects. Implications are discussed from a cultural perspective.

Introduction

There has been a growing interest in cultural diversity and mental health in aging research. One expression of this interest has been the quest to identify the cultural appropriateness of measures of depressive symptoms (Cole, Kawachi, Maller, & Berkman, 2000; Gallo, Cooper-Patrick, & Lesikar, 1998; Miller, Markides, & Black, 1997; Mui, 1996; Mui, Burnette, & Chen, 2002). Because culture shapes values, beliefs, attitude, and behaviors of individuals as a group (Dilworth-Anderson & Burton, 1999), the way in which people express themselves and expose their emotions may vary by cultural orientations. Given that most research on depressive symptoms relies on self-reports and that the expression of emotions has been found to vary by cultural grouping, it is important to identify cultural influences on reporting depressive symptoms (Cole et al., 2000; Gallo et al., 1998; Mui et al., 2002).

Several recent studies have provided empirical evidences of racial/ethnic variations in depressive symptom reports. Cole et al. (2000) found evidence that, compared to Whites matched on overall number of depressive symptoms, African-Americans are more likely to report symptoms related to interpersonal relationships. Research on young adults by Iwata and colleagues (Iwata & Buka, 2002; Iwata, Turner, & Lloyd, 2002) showed that African-Americans and Native Americans are more likely to endorse somatic symptoms over affective symptoms and that Japanese and immigrant Hispanics tend to inhibit the expression of positive affect. The response set with regard to positive items in depression inventories is a particular issue in Asian cultures, where modesty and self-effacement are often highly regarded as cultural virtues. Previous studies on Korean populations suggest that Koreans tend to be more reluctant to endorse positive affect questions (Cho, Nam, & Suh, 1998; Jang, Haley, & Small, 2001; Noh & Chen, 1998). However, these studies are based on descriptive and relatively basic analyses that do not draw out the full implications of the response set. One particular area that has not received attention has to do with whether or not the level of acculturation exerts any systematic effect on the symptom expression of those who immigrated to a new culture.

In the present study, the focus was on one of the fastest growing segments of the immigrant populations in the USA: Korean-American elders.

Correspondence: Yuri Jang, Ph.D., Department of Aging and Mental Health, Florida Mental Health Institute, University of South Florida, 13301 Bruce B. Downs Blvd., Tampa, FL 33612, USA. E-mail: yjang@fmhi.usf.edu

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A majority of Korean-Americans immigrated to the USA after the Immigration Reform Act of 1965 (Hurh & Kim, 1984). The Census 2000 tallied more than one million Korean residents, representing an increase of over 1500% since 1970 (US Census, 2000). Within this population, the proportion of elderly has been also increased; as of the last census, more than 6% of the Korean residents in the USA were aged 65 and over (US Census, 2000). Most of these Korean-American elders are foreign born who either came to USA in earlier years of their life for education or work or immigrated in their later years to reunite with family members who had immigrated to the USA. While relatively homogeneous in terms of nation of birth, they are heterogeneous in socio-economic status and—of particular relevance to the investigation reported here—the level of acculturation.

Acculturation, the process of cultural adaptation by individuals, has been conceptualized as a central component in understanding the varied experience of ethnic and cultural minorities (Berry, 2002). While the primary component of acculturation measures is ability to use the host language, friendship patterns, knowledge of appropriate behavior in different contexts, use of media, and many other indications of an individual's ability to get along with the host culture have been studied (Berry, 2002; Chriboga, 2004). Research has consistently shown that higher levels of acculturation attained in a host society are associated with better mental health outcomes (Berry & Kim, 1988; Chiriboga, Black, Aranda, & Markides, 2002; Myers & Rodriguez, 2003). Explanations provided to account for this association are multiple. Perhaps the most common explanation is that the higher socio-economic status usually found among more acculturated individuals may increase access to resources and benefits, which may in turn generate better mental health outcomes (Berry & Kim, 1988; Chiriboga et al., 2002). Becoming knowledgeable about a new culture may also be an indicator of successful coping or adaptability, which in turn has been linked to positive emotional states (Jang, Kim, & Chiriboga, 2004; Myers & Rodriguez, 2003). Another possibility, one hypothesized to be the case among Korean-American elders, is that along with the process of acculturation may come reorganization in the way in which people think and feel. In other words, people who become more acculturated may also be more likely to adopt the ways of thinking and feeling that are prevalent in the host culture. According to this line of thinking, the less acculturated Korean older adults may adhere to a more traditional Confucian ethic of modesty and for this reason, may be reluctant to express positive emotions. In contrast, those who are more acculturated may be more accepting of Westernized ways of thinking and expression and more likely to reveal and express themselves in a positive way.

To undertake our investigation, we used two measures of depressive symptoms for which well-established translations exist for the Korean language. The two measures, the Geriatric Depression Scale (GDS; Brink et al., 1982; Yesavage et al., 1983) and the Center for Epidemiologic Studies-Depression Scale (CES-D; Radloff, 1977), are the most widely used assessment tools for depressive symptoms. Both measures have been translated into many different languages and used in various racial/ethic groups (Mui et al., 2002; Stiles & McGarrahan, 1998). The Korean versions of the GDS and the CES-D have been developed and their psychometric properties have been validated with various age groups of Koreans residing in Korea and the USA (e.g., Cho et al., 1998; Jang et al., 2001; Pang, 1995). Studies using the instruments on Korean populations have consistently reported higher scores of depressive symptoms compared to other racial/ethnic groups (Cho et al., 1998; Jang et al., 2001). Indeed, the Korean-American population has been identified as a high-risk group in mental health research (Hughes, 2002; Hurh & Kim, 1990). On the other hand, the reportedly high levels of symptoms may in fact be due to the aforementioned cultural differences in response styles.

Our specific hypothesis was that the response patterns evident in depressive symptom measures (here exemplified by the short forms of the GDS and the CES-D) in Korean-American elders would vary according to the level of acculturation. Korean older adults with lower levels of acculturation were hypothesized to score lower on positive affects and to demonstrate overall differences in the factorial structure of their responses.

Method

Participants

In the fall of 2003, a survey was conducted in two cities in Florida: Tampa and Orlando. Participants were recruited through a variety of sources including local Korean churches, senior centers and elderly associations. Participants were required to be 60 or older and to have sufficient cognitive ability to understand and complete the survey. The survey interviews were conducted by interviewers fluent in the Korean language and at locations convenient to the participants, such as their homes, churches and senior centers. Detailed information on the procedure of this project has been described elsewhere (Jang et al., 2004).

Measures

Acculturation. Level of acculturation was assessed with six items including self-reported English proficiency, languages used in conversations with family, preferred languages for TV or video,

preferred languages for book or newspaper, food preference, and ethnicity of close friends. The items were adopted from a measure widely utilized in research on Hispanic populations (Hazuda, Stern, & Haffner, 1988). Each response was coded from 1–5, with a higher score indicating greater levels of acculturation. Internal consistency based on the six items was shown to be moderately high ($\alpha = 0.86$). Factor analysis yielded one dominant factor, indicating that the items represent a single domain.

Depressive symptoms. The Geriatric Depression Scale-Short Form (GDS-SF; Sheikh & Yesavage, 1986) and the short form of the Center for Epidemiologic Studies-Depression Scale (CES-D; Radloff, 1977) were used to index depressive symptoms. The GDS-SF included 15 items with a yes/no format. The scale includes five positive items (e.g., 'Are you satisfied with your life?' and 'Do you feel happy?') and 10 negative items (e.g., 'Do you feel that your life is empty?' and 'Do you feel helpless?'). The total score was calculated by counting the number of responses that suggest probable depression. Scores can range from 0 (no depressive symptoms) to 15 (severe depressive symptoms). Reliability of the GDS-SF in the current sample was satisfactory ($\alpha = 0.79$). The short form of the CES-D (Radloff, 1977) assessed the frequency of depressive symptoms during the past week on a four-point scale. The scale includes two positive items ('I felt hopeful' and 'I was happy') and eight negative items (e.g., 'I felt depressed' and 'I felt lonely'). The positive items were reverse-coded and all items were summed into total scores that ranged from 0 (no depressive symptoms) to 30 (severe depressive symptoms). Reliability in the present sample was satisfactory ($\alpha = 0.80$).

Other variables. Demographic information included age (in years), gender (0 = male, 1 = female), marital status (1 = unmarried, 2 = married), and educational attainment (1 = < high school, 2 = ≥ high school). Chronic conditions were measured with a checklist of nine conditions (e.g., arthritis, stroke, heart problems, diabetes, and cancer) with a yes/no format. A summated score was used for the analysis.

Statistical analysis

As a preliminary step, the association between acculturation and depressive symptoms measured with the GDS-SF and the CES-D was assessed using bivariate and multivariate analyses. To further examine the function of acculturation, the sample was divided into low and high acculturation groups based on median split. The characteristics of the high and low groups were compared using *t*-test and Chi square analysis.

Factor structures of the GDS-SF and the CES-D in low and high acculturation groups were computed using principal components analysis with varimax rotation. The extracted factor matrices were then compared between the groups. A congruence coefficient was calculated to quantify the overlap between factor matrices and determines the degree of similarity between them (Gorsuch, 1974).

The age- and gender-adjusted mean scores on individual items, subscales (positive-item total and negative-item total), and total scores of the GDS-SF and the CES-D were calculated for low and high acculturation groups. Comparative analyses between low acculturation and high acculturation groups on the mean scores of individual items, sub-scales, and total scores were conducted using ANCOVA. In order to detect different response patterns between the groups, a differential item functioning (DIF; Stricker, 1982) analysis was conducted using a partial correlation method suggested by Iwata and colleagues (Iwata & Buka, 2002; Iwata et al., 2002). We computed the correlation between individual items and group membership (coded as high versus low acculturation group) while partialling out the underlying depressive symptoms. The purpose of this latter analysis was to identify the patterns of the endorsement of individual items controlling for the overall levels of depression. Since we hypothesized that positive items would be culturally biased, negative-item total was used as a matching variable. Negative-item total scores were logarithmically transformed to avoid problems associated with multicollinearity. Age and gender were also controlled for the analysis. We considered the high acculturation group as the reference group (coded as '0') and low acculturation group as the focal group (coded as '1'). Therefore, significant correlation coefficients between an item and group membership after controlling for age, gender, and negative-item total indicate an over- or under-endorsement of the item in one group compared to the other.

Results

Demographic characteristics of the respondents

The sample consisted of 230 older adults with an age range from 60–92, and an average age of 69.8 years (SD = 7.05). More than half (59.1%) was female, and 73% were married. About 58% of the sample had received more than high school education. The number of years lived in the USA ranged from 1–49 with a mean of 22.9 (SD = 10.9). The total number of chronic conditions was averaged 1.36 (SD = 1.11). The mean score for acculturation was 11.4 (SD = 4.45) with a range of 6–25. A majority (75%) of the sample rated their English proficiency as either 'very poor' or 'poor.' The mean scores for the GDS-SF and the CES-D were 4.22 (SD = 3.29) and 8.15 (SD = 5.34), respectively.

Twenty-four percent of the sample scored higher than 5, a suggested cut-off score for probable depression on the GDS-SF (Sheikh & Yesavage, 1986). When applying the cut-off score for the short form of the CES-D (Radloff, 1977), more than 30% of the sample falls under the category of probable depression (scores being equal to or higher than 10).

Preliminary analyses on acculturation and depressive symptoms

To understand underlying relationships between acculturation and depressive symptoms, zero order correlations were computed. A higher level of acculturation was significantly associated with younger age, male gender, being married, and having a higher education. The GDS-SF and the CES-D had a similar pattern of correlations, indicating that higher levels of depressive symptoms are connected with older age, female gender, an unmarried status, lower levels of education, and higher numbers of chronic conditions. Acculturation was significantly associated with both the GDS-SF ($r = -0.36$, $p < 0.001$) and the CES-D ($r = -0.30$, $p < 0.001$), suggesting the higher likelihood of depressive symptoms among those with lower levels of acculturation. As might be anticipated, the two types of depression indexes were themselves highly interrelated ($r = 0.70$, $p < 0.001$).

The two types of depression measures were then regressed on demographic variables, chronic conditions, and acculturation. Demographic variables and chronic conditions accounted 23% and 21% of the variance of the GDS-SF and the CES-D, respectively. Lower levels of education and more chronic conditions were found to be common significant predictors of depressive symptoms measured with the GDS-SF and the CES-D. After controlling for the effects of demographics and chronic conditions, acculturation explained a significant amount of additional variance (4% each), resulting in a total explained variance of 27% and 25% of the models with the GDS-SF and the CES-D, respectively. Those with lower levels of acculturation were more likely to have depressive symptoms regardless of the types of the measurement ($\beta = -0.22$, $\beta < 0.01$ for the GDS-SF; $\beta = -0.21$, $\beta < 0.01$ for the CES-D).

Comparison between low acculturation group and high acculturation group

With a special interest in the role of acculturation in manifestation of depressive symptoms, the total sample was divided into low and high acculturation groups using a median split ($\text{Median}_{\text{acculturation}} = 11$), and a variety of comparative analysis was conducted. Compared to the high acculturation group ($n = 99$), the low acculturation group ($n = 129$) was likely to be older ($t = 4.13$, $p < 0.001$), female ($\chi^2 = 6.08$, $p < 0.05$), and less educated ($\chi^2 = 51.7$, $p < 0.001$).

Next, we computed factor structures of the GDS-SF and the CES-D. Principal components analysis with varimax rotation was conducted separately for the low and high acculturation groups. The factor solutions for the GDS-SF are shown in Table I. In the low acculturation group, five factors were extracted, accounting for a total of 58.9% of the variance. In the high acculturation group, six factors were extracted explaining 69.3% of the variance. As shown in Table II, the CES-D factor analysis extracted three factors for the low acculturation group with a total explained variance of 60.4%

Table I. Factor loading for sub-items of the GDS-SF: Results from principal components (varimax) analysis.

	Low acculturation group					High acculturation group					
Item	1	2	3	4	5	1	2	3	4	5	6
1. Satisfied with life	0.40	**0.64**	0.12	0.04	0.04	**0.84**	0.03	0.13	0.04	0.03	0.06
2. Dropped activities	0.09	0.18	**0.69**	0.07	0.04	0.02	0.18	**0.80**	0.04	0.04	0.05
3. Feel life is empty	**0.77**	0.19	0.10	0.03	0.04	**0.60**	0.39	0.39	0.03	0.02	0.02
4. Often get bored	0.45	**0.55**	0.09	0.12	0.07	**0.56**	0.53	0.21	0.07	0.12	0.14
5. Good spirits	0.01	**0.79**	0.15	0.14	0.08	**0.67**	0.29	0.20	0.06	0.15	0.09
6. Afraid something bad	0.27	0.13	0.36	**0.53**	0.09	0.10	**0.73**	0.07	0.01	0.03	0.16
7. Feel happy	0.03	**0.88**	0.15	0.04	0.10	**0.89**	0.05	0.02	0.09	0.11	0.05
8. Feel helpless	**0.66**	0.13	0.01	0.34	0.32	0.23	**0.63**	0.14	0.27	0.24	0.08
9. Prefer to stay at home	0.03	0.02	0.06	0.16	**0.85**	0.05	0.09	0.10	**0.87**	0.21	0.17
10. Memory problem	**0.51**	0.17	0.29	0.03	0.20	0.00	0.09	0.02	0.08	**0.92**	0.06
11. Wonderful to be alive	0.09	0.18	0.06	**0.85**	0.08	**0.53**	0.11	0.15	0.21	0.35	0.40
12. Feel worthless	**0.65**	0.13	0.08	0.02	0.35	0.03	**0.76**	0.23	0.24	0.04	0.02
13. Feel full of energy	0.32	0.40	0.38	0.08	0.27	0.17	0.42	0.23	**0.63**	0.13	0.13
14. Feel hopeless	0.43	0.12	0.36	0.27	0.38	0.05	0.19	0.05	0.11	0.04	**0.85**
15. Most people are better off	0.07	0.00	**0.75**	0.01	0.08	0.29	0.03	**0.60**	0.06	0.19	0.43
Eigenvalue	2.4	2.4	1.6	1.2	1.2	3.1	2.3	1.4	1.3	1.2	1.1
Variance explained (%)	16	16	10	8.5	8.4	20	15	9.5	9.1	7.9	7.8

Loadings in bold and underlined indicate those selected to define the factor.

Table II. Factor loading for sub-items of the CES-D: Results from principal components (varimax) analysis.

	Low acculturation group			High acculturation group	
Item	1	2	3	1	2
1. Bothered by things	**0.55**	0.01	0.16	**0.62**	0.21
2. Trouble concentrating	**0.85**	0.05	0.03	**0.77**	0.14
3. Felt depressed	**0.69**	0.43	0.07	**0.67**	0.27
4. Everything an effort	**0.73**	0.24	0.04	**0.64**	0.06
5. Felt hopeful	0.08	0.24	**0.80**	0.23	**0.80**
6. Felt fearful	0.42	**0.59**	0.17	**0.60**	0.13
7. Restless sleep	0.08	**0.83**	0.14	**0.54**	0.11
8. Was happy	0.23	0.19	**0.78**	0.02	**0.86**
9. Felt lonely	**0.55**	0.38	0.03	**0.58**	0.46
10. Could not get going	**0.72**	0.26	0.03	**0.69**	0.49
Eigenvalue	3.70	1.32	1.02	4.16	1.19
Variance explained (%)	37	13.2	10.2	41.5	11.9

Loadings in bold and underlined indicate those selected to define the factor.

Table III. Age- and gender-adjusted mean scores of the GDS-SF and comparative analyses.

	Age- and gender-adjusted mean (SD)			
Item	Low acculturation group ($n=129$)	High acculturation group ($n=99$)	F	Partial correlation with group membership[b]
Positive item (reversed[a])				
1. Satisfied with life	0.22 (0.42)	0.10 (0.32)	6.09*	0.10
5. Good spirits	0.26 (0.44)	0.15 (0.36)	5.60*	0.11
7. Feel happy	0.23 (0.42)	0.08 (0.27)	9.29**	0.18*
11. Wonderful to be alive	0.14 (0.35)	0.07 (0.25)	3.05	0.08
13. Feel full of energy	0.46 (0.50)	0.33 (0.47)	1.66	0.01
Negative item				
2. Dropped activities	0.46 (0.50)	0.37 (0.48)	0.80	−0.05
3. Feel life is empty	0.38 (0.48)	0.20 (0.40)	3.27	0.01
4. Often get bored	0.27 (0.45)	0.19 (0.39)	1.27	−0.07
6. Afraid something bad	0.55 (0.49)	0.35 (0.47)	3.84	0.02
8. Feel helpless	0.47 (0.50)	0.29 (0.45)	2.86	0.01
9. Prefer to stay at home	0.34 (0.47)	0.43 (0.49)	2.36	−0.14
10. Memory problem	0.37 (0.48)	0.23 (0.42)	2.98	0.05
12. Feel worthless	0.25 (0.43)	0.11 (0.31)	2.06	−0.00
14. Feel hopeless	0.22 (0.41)	0.08 (0.27)	3.40	0.05
15. People are better off	0.53 (0.50)	0.31 (0.46)	5.76*	0.13
Positive-item total (reversed)	1.35 (1.47)	0.75 (1.19)	9.68**	0.14*
Negative-item total	3.86 (2.46)	2.32 (2.06)	11.2**	–
GDS-SF total score	5.21 (3.35)	3.07 (2.84)	15.0***	0.14*

*$p<0.05$, ** $p<0.01$, *** $p<0.001$. [a]Responses to positive items have been recoded so that higher scores indicate higher levels of depression. [b]Age, gender, and negative-item total have been partialled out. Group membership (high acculturation group = 0, low acculturation group = 1).

and two factors for the high acculturation group with 53.4% of the explained variance.

A visual inspection of the factor matrices suggested that different patterns and structures existed for the low and high acculturation groups for both the GDS-SF and the CES-D. In order to quantify these possible differences, we calculated congruence coefficients between the rotated factors of each group in the same order (Gorsuch, 1974). Results indicated that the factors extracted for the GDS-SF had congruence coefficients of 0.52, 0.50, 0.84, 0.40, and 0.48, respectively. Comparison of factor structures for the CES-D provided congruent coefficients of 0.93 and 0.45 for the first and the second factors. Given that congruence coefficients greater than 0.90 are conventionally suggested to be an indication of factor invariance (Chan, Ho, Leung, Chan, & Yung, 1999), factor solutions of the low and high acculturation groups were considered to be not well replicated except the first factor in the CES-D.

Tables III and IV include age- and gender-adjusted mean scores of the individual items, sub-scales (simple summated totals for positive items and negative items) and total scores of the GDS-SF and the CES-D for both groups. It should be noted that responses to positive items are reverse-coded so that higher scores indicate higher levels of depression. ANCOVA results revealed significant mean differences in four items of the GDS-SF and five items of the CES-D. Significant differences were

Table IV. Age- and gender-adjusted mean scores of the CES-D and comparative analyses.

Item	Age- and gender-adjusted mean (SD)			
	Low acculturation group ($n = 129$)	High acculturation group ($n = 99$)	F	Partial correlation with group membership[b]
Positive items (reversed[a])				
5. Felt hopeful	1.63 (1.07)	0.96 (10.15)	120.3**	0.23***
8. Was happy	1.33 (1.20)	0.93 (10.13)	70.45**	0.15*
Negative items				
1. Bothered by things	0.84 (0.75)	0.77 (0.74)	0.51	−0.08
2. Trouble concentrating	0.80 (0.91)	0.49 (0.66)	5.30*	0.03
3. Felt depressed	0.76 (0.84)	0.51 (0.66)	2.65	−0.05
4. Everything an effort	1.11 (0.91)	0.79 (0.75)	6.47*	0.09
6. Felt fearful	0.64 (0.81)	0.47 (0.70)	1.00	−0.05
7. Restless sleep	0.70 (1.00)	0.55 (0.81)	0.76	−0.06
9. Felt lonely	0.98 (0.97)	0.67 (0.73)	3.09	−0.03
10. Could not get going	0.83 (0.96)	0.38 (0.61)	11.0**	0.06
Positive-item total (reversed)	3.00 (1.83)	1.82 (1.94)	15.6***	0.23**
Negative-item total	6.53 (4.74)	4.62 (3.77)	6.03*	–
CES-D total score	9.53 (5.26)	6.44 (5.01)	11.8***	0.23**

*$p < 0.05$, **$p < 0.01$, *** $p < 0.001$. [a]Responses to positive items have been recoded so that higher scores indicate higher levels of depression [b]Age, gender, and negative-item total have been partialled out. Group membership (high acculturation group = 0, low acculturation group = 1).

observed in three out of five positive items of the GDS-SF and all positive items of the CES-D. The low acculturation group showed lower levels of positive emotions on items in the GDS-SF (#1 'satisfied with life,' #5 'good spirits,' and #7 'feel happy') and the CES-D (#5 'felt hopeful' and #8 'was happy'). Caution should be exercised in considering the findings from the item-level analysis due to the small sample sizes within each group, skewed distribution, and the restricted range of responses.

As a way to detect an item differential functioning (DIF), we used a partial correlation method, and the results are presented in the far right columns in Tables III and IV. Correlation coefficients of individual items, sub-scales and total sores of the GDS-SF and the CES-D with group membership (high acculturation = 0, low acculturation = 1) after partialling out the effects of age, gender, and the underlying depressive symptoms (negative-item total) were assessed. Significant coefficients were found in one positive item of the GDS-SF (# 7 'feel happy') and two positive items of the CES-D (# 5 'felt hopeful' and # 8 'was happy'). The finding indicates that those items are under-endorsed by the low acculturation group.

Discussion

The present study examined how the level of acculturation influences manifestation of depressive symptoms using two standard measures of depression, the GDS-SF and the CES-D, with 230 Korean-American older adults. Given the unique cultural characteristics of modesty and self-effacement in Asian culture, we hypothesized that Korean-American older adults who were less acculturated to Western culture would be more likely to inhibit positive affects, compared with those who were highly acculturated, and that the factorial structures of the high and low acculturation groups would differ. Results from a variety of statistical analyses provided support for the proposed hypotheses.

Consistent with the previous studies (e.g., Berry & Kim, 1988; Chiriboga et al., 2002; Myers & Rodriguez, 2003), the present study confirmed the connections between low acculturation and high depressive symptoms. Even after controlling for the effects of demographic variables and chronic conditions, low acculturation remained as a significant risk factor to depressive symptoms in both models of the GDS-SF and the CES-D. Compared to the previous studies, that have conceptualized level of acculturation as a proxy for personal resources or as an index of acculturative stress (e.g., Berry & Kim, 1988; Chiriboga et al., 2002; Myers & Rodriguez, 2003), the unique contribution of the present study was its focus on the role of acculturation in the manifestation of depressive symptoms. We expected that acculturation would be an influential factor that determines the way in which individuals express or expose their emotional states.

To test our hypothesis, we divided the sample into two groups based on the level of acculturation and conducted a variety of comparative analyses. In considering the results, it should be kept in mind that the Korean versions of the GDS-SF and the CES-D demonstrated reasonably strong internal consistencies when calculated for the entire sample. However, the factor structures of the scales were found to be incomparable across low and high acculturation groups. This finding indicates that there are structural and conceptual differences in how individuals perceive and respond to the items

in the GDS-SF and the CES-D depending on their degree of acculturation.

In a mean-level analysis, consistently higher scores of depressive symptoms were observed in the low acculturation group. Particularly for the three positive items in the GDS-SF (#1 'satisfied with life,' #5 'good spirits,' and #7 'feel happy') and two positive items in the CES-D (#5 'felt hopeful' and # 8 'was happy'), those low in acculturation exhibited significantly greater levels of negative responses (higher presence or frequency of depressive symptoms). In addition, the differential item functioning (DIF) analysis identified the items that low acculturation group had under-endorsement; one item in the GDS-SF (# 7 'feel happy') and two items in the CES-D (# 5 'felt hopeful' and # 8 'was happy') in the low acculturation group. As hypothesized, those with lower levels of acculturation were more likely to inhibit to the items on positive affects. The higher level of adherence to their original culture, which emphasizes moderation in expressing feelings and emotions (Jang et al., 2001; Mui et al., 2002), may be responsible for their reluctance to respond positively to positive-affect items. Consistent with Confucian principles, traditional Korean culture places a high emphasis on modesty, and it is a cultural norm not to express positive personal emotions such as happiness and satisfaction. The restricted exposure of positive emotions is also understood as a consideration for those less fortunate from a perspective of collectivism. On the other hand, those who are highly acculturated may be more accustomed to Westernized ways of thinking and expressions. The free expression of personal emotions may have been acquired through the process of acculturation and social learning.

The present study may help to explain the findings of previous research studies, where Korean older adults were found to manifest relatively more symptoms of depression. Specifically, our findings raise questions about whether the reported depression scores are indicative of true emotional states or an artifact of cultural response styles. The culture-specific response patterns should be taken into account in cross-racial/ethic comparative research to yield a meaningful and valid comparison. In accordance with the increasing needs of cross-cultural research, this issue carries a great deal of importance and invites further examinations.

Findings from the present study are limited by the use of a small sample of convenience. Future studies will need to employ representative samples of Korean-Americans to increase the generalizability of the findings. Also, the examination of cultural response patterns should include other racial/ethnic groups, as a means of placing the present findings of variations by acculturation in a broader context. The presented findings were explanatory in its nature, and further assessment with other analytic techniques, such as confirmatory factor analysis, and utilization of multifaceted measures of acculturation needs to be conducted.

The present study calls attention to the possibility that rates of depressive symptoms in racial/ethnic groups may be misestimated due to their response styles. Improving understanding of these cultural variations will be the first step towards developing culturally sensitive assessment tools for mental health. Development of such an instrument will facilitate accurate detection of mental health problems and identification of high-risk subgroups of cultural groups.

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