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Adaptation of an Acculturation Scale for African Refugee Women

**Crista E. Johnson-Agbakwu · Priscilla Flynn ·
Gladys B. Asiedu · Eric Hedberg · Carmen Radecki Breitkopf**

Abstract Newly-arrived African refugees are a vulnerable group of immigrants for whom no validated acculturation measures exist. A valid measurement tool is essential to understand how acculturative processes impact health and health disparities. We adapted the Bicultural Involvement Questionnaire (BIQ) to characterize its reliability among ethnic Somali women residing in Minnesota, and Somali, Somali Bantu, and Burundian women in Arizona. Surveys were administered to 164 adult women. Analyses were conducted along socio-demographic variables of ethnicity, geographic residence, age, and length of time in the United States through t tests and one-way analysis of variance. Exploratory factor analysis was conducted on the modified BIQ. Exploratory factor analyses yielded five subscales: "Speak Native Language", "Speak English Language", "Enjoy Native Activities", "Enjoy American Activities", and "Desired Ideal Culture". The subscales of the modified BIQ possessed Cronbach's α ranging from 0.68 to 0.92, suggestive that all subscales had acceptable to excellent internal consistency. The modified BIQ maintained its psychometric properties across geographic regions of resettled Central and East African refugees.

Keywords Acculturation · African · Biculturalism · Refugees · Women

Background

The largest proportion of African-born resettled refugees to the United States [1] comes from Somalia and Burundi. More than 60,000 African refugees reside in Minnesota, [2], while nearly 14,000 have resettled in Arizona [3]. Approximately 3,500 refugees arrive annually in Arizona with 80 % resettling in the Phoenix metropolitan area. Since 1992, nearly 4,800 Somali women (including Somali Bantus) and nearly 1,000 Burundians have resettled in Arizona. These figures represent refugees directly resettled from overseas, and not secondary migration from other states within the US [3]. Relocating and adjusting to vastly different environments require an adaptive process for both the refugees and the accepting communities. Uncertainties surrounding differences in cultures can result in mistrust and discriminatory practices. The psychological stressors and untoward health outcomes of perceived discrimination are considerable and well documented; thus, it is important to understand the acculturative experiences of this population.

Given these recent demographic shifts in migration patterns to the US, the acculturation process of immigrants and refugees is of interest to health researchers and

C. E. Johnson-Agbakwu (✉)
Southwest Interdisciplinary Research Center, Arizona State University, 411 N Central Ave, Suite 720, MC 4320, Phoenix, AZ 85004, USA
e-mail: cejohn11@asu.edu

P. Flynn
Office of Women's Health, Mayo Clinic, Rochester, MN, USA

Present Address:
P. Flynn
School of Dentistry, University of Minnesota, Minneapolis, MN, USA

G. B. Asiedu · C. R. Breitkopf
Department of Health Sciences Research, Mayo Clinic, Rochester, MN, USA

E. Hedberg
Morrison Institute for Public Policy, Arizona State University, Phoenix, AZ, USA

practitioners because health outcomes are linked to factors associated with adapting to a new culture over time. Berry [4] described acculturation as "the dual process of cultural and psychological change that takes place as a result of contact between two or more cultural groups and their individual members". Historical views of acculturation have posited a unidimensional process in which an inverse linear relation exists between a person's involvement with the original and host cultures [5]. This unidimensional process entailed discarding personal culture of origin as individuals adapt attributes of the new culture. This description was appropriate when immigrants were pressured to assimilate into US society, with little room for retention of their culture of origin. In this process, adopting the host culture involved simultaneously discarding the culture of origin.

However, acculturation does not follow a linear process and often does not lead to loss of cultural identity [6]. As acceptance of cultural pluralism in the US has grown, contemporary conceptual models describe acculturation as a bi dimensional process where persons selectively retain or discard attributes of their culture of origin and their new culture. In fact, Szapocznik and colleagues [5] describe the necessity of persons participating in two cultures to learn and retain "separate sets of rules" in order to successfully navigate within and between the cultures. Therefore, measurement of biculturalism requires an instrument that measures psychological attributes of participation in both cultures simultaneously, rather than movement from the culture of origin to the new culture per unidimensional scales.

Instruments designed to measure changes in beliefs, values, attitudes, and behaviors associated with acculturation are numerous for many ethnic groups, including Hispanic [5, 7–12], Korean [13] Chinese [14], and Arab [15] populations. Few studies have measured acculturation among Central and East African refugees, with the existing studies incorporating proxy measures, such as years lived in the receiving country and English language proficiency among ethnic Somali women [16]. However no known measures of acculturation exist for Somali Bantus or Burundians. Such measures would inform health care policy and clinical practice on the unique needs that exist in caring for refugee populations and further our understanding of how acculturative processes impact health disparities.

The aim of the present research was to develop and test an acculturation instrument distinctive to Central and East African refugee women using principles of Community-Based Participatory Research (CBPR). CBPR is defined as a collaborative approach to research that equitably involves community members, organizational representatives, and researchers in all aspects of the research process whereby partners contribute unique strengths and shared responsibilities to enhance understanding of a given phenomenon and the social and cultural dynamics of the community, and integrate the knowledge gained with action to improve the health and well-being of community members [17]. CBPR has emerged as a crucial strategy in partnering with refugee communities, particularly when working with vulnerable populations [18]. Community-partnered engagement was an essential process throughout every phase of this initiative as community partners remained intricately involved in the design, implementation, interpretation of the results, and dissemination of key findings from this effort.

The Bicultural Involvement Questionnaire (BIQ) [5] was modified and tested for use among ethnic Somali women residing in Arizona [19] and Minnesota (MN), as well as Somali Bantu and Burundian women in Arizona. The BIQ [5] was originally created to measure biculturalism among Hispanic adolescents in Dade County, Florida, and the comfort level that persons reported in the culture of origin and the new culture independent of each other. The importance of developing a scale to measure behaviors, beliefs, attitudes, and values specific to Central and East African refugee women was based on external observation and the unique characteristics of their health profiles. For example, the majority of Somali men readily adopt Western apparel on arrival in the US. Somali women are unique because many retain their distinct cultural attire (e.g., long skirts, draped blouses, head coverings). An additional factor unique to this population is that they are refugees primarily, not immigrants. A majority of Somali refugees are women and children because many men were killed during the civil war. Therefore, women must assume the role of the head of household, which is novel for Somali women in both their country of origin and the US. These factors create a unique profile that may influence the adaptation process and underscore the need to develop an instrument to measure this process and, ultimately, determine its relation to indicators of physical and mental health. This study was a novel first step in elucidating the performance of a culturally and linguistically adapted instrument. Our study's purpose was four-fold: (1) to adapt an orthogonal instrument to distinguish between the dimensions of host and native cultures (2) to determine whether the instrument is valid across selected African cultures (3) to test instrument validity between geographic regions of resettlement (i.e., AZ and MN), and (4) to develop the instrument for ease of administration for low-literacy populations. In this study, the term *refugee* refers to communities of Somali, Somali-Bantu, and Burundian ethnicity.

Methods

This study was part of a larger community-engaged research program examining disparities in the use of preventive services, health literacy, and disease management

outcomes among refugee women in Phoenix AZ and Rochester MN. The study was approved by the Institutional Review Boards of Maricopa Integrated Health System, Mayo Clinic, and Arizona State University.

Survey Translation Process

The BIQ was translated into Somali, Maay Maay, Kiswahili, and Kirundi using a team of bi-lingual, bi-cultural community members in a process of iterative participatory consensus. In this process, the team made iterative revisions to the translations across the respective languages, ensuring that the cultural and conceptual equivalence of the words or phrases were captured rather than just the literal linguistic equivalence. In addition, attention was paid to ensuring that the translated documents reflected the local dialects of the respective languages as well as the breadth of speech to accommodate newly-arrived refugee communities with limited language proficiency. The final documents were reviewed by bi-lingual and bi-cultural community members who did not participate in the translation process and were not study participants. Using this rigorous, iterative participatory consensus approach provided confidence that the fidelity of the questions was maintained across the four language groups.

Participants and Data Collection

Refugee women who were from the local community and/or seeking health care at either the Refugee Women's Health Clinic in Arizona or the Mayo Clinic in Rochester MN were invited to participate in this study. Data were gathered in Phoenix AZ between May and December 2009 and in Rochester MN between May and August 2010. The survey consisted of 59 questions addressing 5 areas of inquiry: demographics, acculturation, health history and desired health knowledge, preferred health care providers, and preferred health education modalities. Surveys were orally administered in face-to-face encounters with trained staff in the participant's language of choice—English, Somali, Maay Maay, Kiswahili, or Kirundi. Remuneration was provided as a gift card to a local store frequented by many Somali women. In Rochester MN, participants received $20 gift cards, whereas in the Phoenix AZ, $25 gift cards were given; differences in remuneration between sites reflected customary amounts provided for community-based study participation, cost-of-living variations, and institutional requirements.

Study Measures

The BIQ [5] was adapted for use in this study. As an orthogonal measure, the BIQ was developed to assess the

degree to which a person feels comfortable in each culture. Due to the low literacy in the native languages of the study population and the knowledge provided by community key informants, modifications were made to the BIQ to enable oral administration of a 3-point Visual Analog Scale (VAS) [19] using faces instead of the 5-point Likert scale in the original BIQ. The questionnaire modifications conveyed frequency of speaking English or their native language and of enjoyment in native or American activities. The modified BIQ (M-BIQ) had 33 items that explored different domains of acculturation ("Appendix").

On the basis of contributions from community key informants regarding content of the items, 2 questions—Q25 and Q28C—were added ("Appendix") to the M-BIQ to elicit frequency of wearing traditional or ethnic attire from the participant's native land to work, at home, and during special occasions, ceremonies, or events. To further explore the relation between residence in ethnic enclaves and acculturation, 2 questions—Q26 and Q28E—were added to elicit residential neighborhood preference ("Appendix").

Statistical Analysis

Descriptive statistics included frequencies or means and standard deviations (SD) for demographics and length of time in the US. Bivariate analyses, including analysis of variance, χ^2, Fisher's exact, and t tests, were performed to examine the relation among descriptive characteristics and scores on the M-BIQ, as well as geographic variation among ethnic Somali women residing in Minnesota and those in Arizona. An α level of less than 0.05 was used to determine statistical significance. Responses to acculturation items were submitted to an exploratory factor analysis [19] with principal components analysis (PCA) enabling the identification of underlying constructs of the M-BIQ. All statistical analyses were performed using Stata (version 11; StataCorp LP).

Results

In total, 164 adult Somali, Somali Bantu, and Burundi women were enrolled. Participants' characteristics by ethnic group are depicted in Table 1. A majority (70 %; n = 114) of the women resided in Phoenix AZ, while the others (30 %; n = 50) resided in Rochester MN. Ethnic Somali women comprised more than half (54 %; n = 88) of the study sample. The mean (SD) age of all participants was 37 (13) years and the mean (SD) length of US residency was 6.2 (5.0) years. Across the 3 ethnicities, Somali women were older [mean age, 41.6 years (14.3);

Table 1 Characteristics of participants (N = 164)

Demographic variables	Ethnicity						P value
	Somali		Somali Bantu		Burundian		
	N	Mean (SD)	N	Mean (SD)	N	Mean (SD)	
Age (years)	86	41.6 (14.3)	25	32.1 (8.5)	49	32.7 (10.6)	0.003**
Length of time in US (years)	80	8.9 (5.5)	18	4.8 (0.7)	45	2.3 (1.7)	0.000***
Income (mean score)	75	1.9 (0.5)	17	2.3 (0.4)	38	2.6 (0.4)	0.83
Education no. (%) (n = 161)							0.000***
None[®]	34	52.3	14	21.5	17	26.2	
Some[a]	26	39.4	9	13.6	31	47	
Advanced[b]	27	90	2	6.7	1	3.3	
Health insurance (%)							0.006**
None	8	100	0	0	0	0	
Public (medicaid)[®]	68	48.6	25	17.9	47	33.6	
Private	12	85.7	0	0	2	14.3	

[®] = Reference group

* $P < 0.05$; ** $P < 0.01$; *** $P < 0.001$

[a] Primary school, English as second language (ESL) classes

[b] High School Diploma, college/graduate degree

Table 2 Somali participant characteristics by geographic location

Characteristic	Geographic location (Somalis)				
	MN		AZ		P
	N	Mean (SD)	N	Mean (SD)	
Age (years)	50	40.5 (15.3)	36	43.0 (12.8)	0.42
Length of time in US (years)	48	10.4 (5.4)	32	6.7 (4.8)	0.003**
Income	48	1.8 (0.4)	27	1.9 (0.5)	0.08
Education no. (%)					0.000***
None[®]	7	20.6	27	79.4	
Some[a]	23	88.5	3	11.5	
Advanced[b]	20	74.1	7	25.9	
Health insurance (%)					0.34
None	5	62.5	3	37.5	
Public (medicaid)[®]	36	52.9	32	47	
Private	9	75	3	25	

[®] = Reference group

* $P < 0.05$; ** $P < 0.01$; *** $P < 0.001$

[a] Primary school, English as second language (ESL) classes

[b] High School Diploma, college/graduate degree

$P = 0.003$], had lived in the US for longer duration [mean, 8.9 years (5.5); $P < 0.001$], and had more advanced educational attainment ($P < 0.001$) (Table 1).

Table 2 denotes geographic comparisons (MN vs. AZ) among ethnic Somali women. No differences were noted in age, income, or insurance status. However, Somali women in MN had lived in the US longer (10.4 vs. 6.7 years; $P = 0.003$) and had higher educational attainment than Somali women in AZ, who primarily had no formal education ($P < 0.001$).

The initial exploratory factor analysis [19] included all 33 items of the M-BIQ. There were 5 resultant factor loadings (eigenvalue range, 1.04–8.16) with an overall reliability of α = 0.87. Because of the multidimensionality of the various underlying constructs (i.e., the subscales "Speak Native Language," "Speak English Language", "Enjoy Native Activities", "Enjoy American Activities", and "Desired Ideal Culture"), it was determined that a single composite score would obscure, rather than show, important differences between these factors. Hence, the M-BIQ was divided along these relevant subscales and analyzed individually in iterative factor analyses. Most items correlated to a factor loading of at least 0.40 with at least 1 other item in the subscale (Table 3).

Because of the assumption that participants may be obligated to speak English in work environments, the question components on "Speak Native Language at work" and "Speak English Language at work" appeared to lower primary factor loadings. Hence, these 2 items were removed from the EFA, which resulted in a substantial increase in the Cronbach's α of these subscales, from 0.48 to 0.68 (Speak Native Language) and from 0.82 to.85 (Speak English Language) (Table 4).

The M-BIQ maintained its psychometric properties across ethnicity and geography; the items were highly correlated within the individual subscales that had acceptable to excellent internal consistency, with α ranging from 0.68 to 0.92. Similarly, a correlation matrix across the individual subscales showed poor correlation with each other (α = 0.47), enhancing our assumption of the presence of distinct yet correlated constructs within the M-BIQ (Table 4). Overall, our analyses suggested that the M-BIQ possesses 5 distinct underlying factors that are internally consistent within each respective subscale, thereby retaining its original factor structure.

Table 3 Factor loadings based on exploratory factor analyses

Item	Eigenvalues	Factor loadings				Mean (SD)	Cronbach α
		1	2	3	4		
Sub-scale 1: speak native language	1.31	var 1.30	var 0.29				0.48
How often[a]	prop 1.20	prop 1.20	prop 0.27				
At home		0.35	−0.25			2.82 (0.47)	
At work		0.18	0.3			1.57 (0.77)	
With friends		**0.76**	0.01			2.73 (0.49)	
In general		**0.73**	0.01			2.73 (0.49)	
Sub-scale 2: speak english language	2.25	var 2.16	var 1.65				0.82
How often do you speak English	prop 1.11	prop 1.07	prop 0.82				
At home		**0.76**	0.04			1.6 (0.65)	
At work		0.18	0.44			1.77 (0.88)	
With friends		**0.71**	0.14			1.61 (0.65)	
In general		**0.55**	0.34			1.7 (0.69)	
Sub-scale 3: enjoy native activities	2.56	var 2.32	var 1.52	var 1.44	var 1.08		0.76
How often do you enjoy	prop 0.84	prop 0.76	prop 0.50	prop 0.47	prop 0.35		
Music from your native country		−0.2	0.09	**0.66**	0.04	2.21 (0.79)	
Dances from your native country		0.14	−0.08	**0.7**	−0.02	1.99 (0.81)	
Restaurants with a flavor of your native country		0.35	−0.01	0.25	0.18	2.10 (0.86)	
TV programs/movies from your native country		**0.67**	0.07	−0.01	0.14	1.89 (0.85)	
Radio stations from your native country		**0.69**	0.02	−0.02	0.02	1.66 (0.84)	
Books and magazines from your native country		**0.63**	0.05	0.06	−0.11	1.66 (0.80)	
Shopping in ethnic stores representing your culture		0.09	**0.58**	0.02	0.05	2.45 (0.65)	
Going to traditional/religious ceremonies/events		0.3	**0.48**	−0.03	−0.09	2.50 (0.68)	
Sub-scale 4: Enjoy American activities	3.82	var 3.10	var 3.03	var 2.57	var 1.20		0.87
How often do you enjoy	prop 0.92	prop 0.75	prop 0.74	prop 0.62	prop 0.29		
American music		0.07	**0.78**	0	0.06	1.70 (0.72)	
American dances		0.06	**0.76**	0.04	−0.08	1.52 (0.68)	
American restaurants/food		0.02	0.3	0.35	0.25	1.79 (0.77)	
American TV programs/movies		**0.58**	0.13	−0.12	0.31	2.02 (0.84)	
American radio stations		**0.63**	0.16	0.14	−0.08	1.71 (0.77)	
American books and magazines		**0.7**	0.07	0.02	0.09	1.85 (0.80)	
Shopping in American stores		0.27	−0.13	0.16	**0.42**	2.25 (0.79)	
Going to American ceremonies/events		0.02	0.15	**0.54**	0.07	1.64 (0.76)	
Sub-scale 5: desired ideal culture	5.21	var 4.58	var 4.05	var 2.69	var 1.92		0.92
If you could[b]	prop 0.95	prop 0.84	prop 0.74	prop 0.49	prop 0.35		
Food		0.16	0.15	**0.4**	0.01	1.5 (0.58)	
Music		0.09	**0.58**	0.03	0.09	1.51 (0.70)	
Attire		0.08	**0.66**	0.14	−0.09	1.37 (0.58)	
Dances		0.02	**0.76**	−0.01	0.01	1.46 (0.65)	
Neighborhood		**0.74**	0.02	0.21	−0.04	1.62 (0.70)	
Shops		**0.72**	−0.05	0.18	0.08	1.66 (0.74)	
Friends		**0.88**	0.08	−0.11	−0.03	1.58 (0.65)	
Radio/TV programs		**0.43**	0.31	−0.01	0.26	1.69 (0.74)	
Language		**0.6**	0.33	−0.03	0.08	1.5 (0.68)	

var = variance explained by the factor; prop = proportion of variance accounted for by the factor

Bold values: factor loadings greater than 0.40

[a] How often do you speak your native language

[b] If you could have your way, how would you wish the following aspects of your life to be like — completely from my culture, somewhat from my culture, or completely American

Table 4 Subscale descriptive statistics (n = 164)

Factor/subscale	No. of items	Score range	Mean (SD)	Cronbach α	Correlations				
					1	2	3	4	5
1. Speak Native Language[a]	3	3–9	8.30 (1.11)	0.68	1				
2. Speak English Language[a]	3	3–9	4.91 (1.73)	0.85	−0.322	1			
3. Enjoy Native Activities	8	8–24	16.54 (3.96)	0.76	0.088	0.038	1		
4. Enjoy American Activities	8	8–24	14.46 (4.43)	0.87	−0.151	0.51	0.177	1	
5. Desired Ideal Culture	9	1–25	13.9 (4.79)	0.92	−0.171	0.263	−0.377	0.265	1
Full Scale (all question items)	33	39–82	61.44 (9.82)	0.87					

[a] "At work" excluded

Table 5 Exploratory factor analysis of M-BIQ

Scales	Pooled (AZ + MN)		AZ		MN	
	EV	α	EV	α	EV	α
Speak native	1.3	0.68	1.37	0.7	1.15	0.61
Speak english	1.88	0.85	1.92	0.85	1.76	0.84
Enjoy native activities	2.56	0.76	2.49	0.74	2.64	0.78
Enjoy American activities	3.83	0.87	3.66	0.85	4.07	0.89
Desired ideal culture	5.21	0.92	5.67	0.94	3.07	0.79

α, Cronbach α; EV, eigenvalue

Table 5 shows the acculturation subscales of the M-BIQ, comparing geographically distinct regions (AZ vs. MN) with the pooled subscales. In general, the subscales performed consistently well across geographic regions, with all α > 0.60. The subscale "Desired Ideal Culture" demonstrated the greatest difference by geographic region, with greater internal consistency in AZ relative to MN.

Discussion

The notion of the "healthy immigrant effect" denotes that immigrants to the US often arrive healthier than the native-born population in their new country of residence. It has been shown that this migrant health advantage diminishes dramatically over time, giving rise to chronic diseases [1, 20, 21]. However, evidence suggests that among refugees, the healthy immigrant effect may not be apparent as refugees may endure poor living conditions in refugee camps that lead to negative health consequences [22–24]. In addition, refugee women are an especially vulnerable population, facing additional obstacles to maintaining their health and well-being. Hence, validated acculturation measures specific to refugee populations are critical to furthering the understanding of how acculturation processes may affect health disparities.

To our knowledge, this is the first study reported in the literature to elucidate the performance of a culturally and linguistically adapted instrument (M-BIQ) in refugee populations, advancing our understanding of the processes of acculturation among first-generation Central and East African refugee women. The five acculturative subscales identified in this work remained reliable, maintaining moderate to strong Cronbach's α across 2 geographic regions in the US and across varied African ethnic groups. Further research is needed to determine the degree to which the individual subscales can be used as specific indices of acculturation—in health contexts particularly—and whether ethnic variation exists.

Methodologic approaches incorporating the principles of CBPR are increasingly applied to research involving refugees to enhance trust building between researchers and the refugee community and build community capacity [25]. CBPR principles guided the cultural adaptation of the BIQ wherein modifications were made to the original instrument to assess positive, negative, and neutral attitudes toward American versus native activities, as well as frequency of language use and desired ideal culture. We modified the BIQ 5-point Likert scale to a 3-point VAS to accommodate ease of verbal administration to low-literacy populations. This modification was based on the prior experience of the first author's work with Somali refugee communities [26] and was reinforced by meetings with local community key informants. In addition, the original words of the BIQ questions [5] were modified from "comfort" and "degree of enjoyment" to frequency "often." Furthermore, on the basis of community input, two questions ("Appendix Q25 and Q28C") were added to the M-BIQ scale to elicit frequency in wearing traditional and ethnic attire to work, home, and special occasions, ceremonies, and events as a reflection of cultural pride and ethnic identity. Two questions were added to further explore the relationship between residence in ethnic enclaves and acculturation. These two questions elicited the participant's residential neighborhood preference

("Appendix Q26 and Q28E"). The modifications were similarly made to the "Desired Ideal Culture" items to include Q28C (ethnic attire) and Q28E (neighborhood preference).

The "Desired Ideal Culture" subscale, consisting of ideal cultural food, music, attire, dance, neighborhood, shops, friends, radio or TV programs, and language demonstrated strong internal consistency. However, geographic differences showed greater reliability for this subscale among refugee women in AZ than refugee women in MN. Future analyses will seek to further elucidate the elements of biculturalism and whether ethnic variation exists along this measure and to explore whether differences in "Desired Ideal Culture" may be attributed to ethnic Somali women in MN being older, living in the US for a greater duration, and acquiring higher educational attainment, thereby allowing more time to adapt to a new culture than those residing in AZ and favoring certain aspects of American life.

Despite statistically significant differences identified between ethnicities (e.g., length of time in the US, education, health insurance) and geographic regions (e.g., length of time in the US, education level), the subscales of the M-BIQ retained their reliability. This initial investigation holds promise that the M-BIQ may be generalizable for Central and East African refugees regardless of geographic resettlement or length of residence in the US. The results are of particular interest because they note considerable differences across ethnicities, including religion (largely, Somali women and Somali Bantus are Muslim and Burundians are Christian). In addition, refugee experiences in acculturation may differ among cities of different sizes; Rochester MN is relatively small (population, 106,769) compared with Phoenix, AZ (population, 941,011) (US Census 2010).

There are limitations to this study, namely the limited sample size, which precluded the performance of confirmatory factor analyses that would further validate the M-BIQ for use in Central and East African refugee populations. In addition, the use of proxy measures of acculturation, such as frequency of language use, may not measure elements of acculturative change, such as attitudes or behaviors, and thus may be limited in scope and sensitivity [27]. Furthermore, only female subjects were included in this study, as this was part of a larger community-engaged research program examining health disparities among refugee women. Lastly, a VAS incorporating 'smiley faces' (see "Appendix"), was used to assess the frequency of enjoyment of varied activities. This modality was intended to facilitate accurate responses to verbally administered surveys for populations with low literacy. However other pictorial VAS imagery could have been explored. Future research will aim to examine the impact of incorporating other visual analog/likert scales for low literate populations across various ethnic/cultural groups.

New Contribution to the Literature

Given the absence of validated acculturation measures for African refugee populations, this study took an innovative and novel first step in testing the performance of a culturally and linguistically adapted instrument reflecting biculturalism that maintains its psychometric properties across distinct US geographic regions and African ethnic groups. Moreover, the use of CBPR to explore additional constructs (e.g., ethnic attire, neighborhood preference) added a culturally appropriate dimension to the instrument development process.

While the M-BIQ was successfully implemented in a community-based partnered research setting, further research will be needed to determine other settings in which this measure may also be utilized. Nonetheless, this study provides new insights on a modification of the original BIQ that elucidate underlying constructs of acculturation for Central and East African refugee women and takes a CBPR approach. Future analyses will examine ethnic and geographic variation among the acculturation subscales so as to inform interventions to improve health literacy and health care use by uniquely targeting specific ethnic and cultural groups based on their respective acculturative processes and experiences. These efforts are expected to inform the design of new paradigms to reduce disparities in health care access, use, and outcomes for newly resettled refugee populations in the US. Moreover, clinicians can familiarize themselves with the M-BIQ content and subscales and further enhance health care services provided to refugees by increasing their own understanding of cultural practices and the acculturative processes that may affect the healthcare utilization patterns and health outcomes of refugees.

Appendix: M-BIQ Acculturation Instrument for Central and Eastern African Refugees

Please circle a number on the line after each question below.

21.* What is your native language? _____

22. How often do you speak your native language?

	Never	Sometimes	Always
a) At home	1	2	3
b) At work	1	2	3
c) With friends	1	2	3
d) In general	1	2	3

23. How often do you speak ENGLISH?

	Never	Sometimes	Always
a) At home	1	2	3
e) At work	1	2	3
f) With friends	1	2	3
g) In general	1	2	3

24. How often do you enjoy:

	Never	Sometimes	Always
a) Music from your native country	1	2	3
b) Dances from your native country	1	2	3
c) Restaurants with a flavor of your native country	1	2	3
d) TV programs/movies from your native country	1	2	3
e) Radio stations from your native country	1	2	3
f) Books and magazines from your native country	1	2	3
g) Shopping in ethnic stores representing your culture	1	2	3
h) Going to traditional/religious ceremonies/events	1	2	3

25. How often do you wear traditional/ethnic attire from your native country?

	Never	Sometimes	Always
a) To work	1	2	3
b) At home	1	2	3
c) To special occasions/ceremonies/events	1	2	3

26. If I had my own choice, I would live:

    1.   In the same neighborhood as people from my own culture

    2.   Away from people from my own culture

    3.   I have no preference where I live

27. How often do you enjoy:

	Never	Sometimes	Always
a) American music	1	2	3
b) American dances	1	2	3
c) American restaurants/food	1	2	3
d) American TV programs/movies	1	2	3
e) American radio stations	1	2	3
f) American books and magazines	1	2	3
g) Shopping in American stores	1	2	3
h) Going to American ceremonies/events	1	2	3

28. Sometimes life is not as we really want it. If you could have your way, how would you like the following aspects of your life to be like? Please mark an **X** in the column that applies to you.

I wish this would be:

	Completely from my culture	Somewhat from my culture	Completely American
Food			
Music			
Attire			
Dance			
Neighborhood			
Shops			
Friends			
Radio/TV programs			
Language			

*Question numbers reflect actual survey sequencing of items

References

1. Singh GK, Siahpush M. All-cause and cause-specific mortality of immigrants and native born in the United States. Am J Public Health. 2001;91:392–9.
2. Minnesota Historical Society Somali. http://education.mnhs.org/immigration/node/579. October 30.
3. Arizona Department of Economic Security. Refugee arrivals current through Sept 2012. https://www.azdes.gov/landing.aspx?id=7241#RA November 30.
4. Berry JW. Acculturation: living successfully in two cultures. Int J Intercult Relat. 2005;29:697–712.
5. Szapocznik J, Kurtines WM, Fernandez T. Bicultural involvement and adjustment in Hispanic-American youths. Int J Intercult Relat. 1980;4:353–65.
6. Beck CT, Froman RD, Bernal H. Acculturation level and postpartum depression in Hispanic mothers. MCN Am J Matern Child Nurs. 2005;30:299–304.
7. Barona A, Miller JA. Short acculturation scale for Hispanic youth (SASH-Y): a preliminary report. Hisp J Behav Sci. 1994;16:155–62.
8. Cruz TH, Marshall SW, Bowling JM, Villaveces A. The validity of a proxy acculturation scale among U.S. Hispanics. Hisp J Behav Sci. 2008;30:425–46.
9. Cuellar I, Arnold B, Maldonado R. Acculturation rating scale for Mexican Americans-II: a revision of the original ARSMA scale. Hisp J Behav Sci. 1995;17:275–304.
10. Marin G, Gamba RJ. A new measurement of acculturation for Hispanics: the bidimensional acculturation scale for Hispanics (BAS). Hisp J Behav Sci. 1996;18:297–316.
11. Marin G, Sabogal F, Marin BV, Otero-Sabogal R, Perez-Stable EJ. Development of a short acculturation scale for Hispanics. Hisp J Behav Sci. 1987;9:183–205.
12. Norris AE, Ford K, Bova CA. Psychometrics of a brief acculturation scale for Hispanics in a probability sample of urban Hispanic adolescents and young adults. Hisp J Behav Sci. 1996;18:29–38.
13. Shim YR, Schwartz RC. Degree of acculturation and adherence to Asian values as correlates of psychological distress among Korean immigrants. J Mental Health. 2008;17:607–17.
14. Pan JY, Wong DE-K, Chan KS, Chan CL-W. Development and validation of the Chinese making sense of adversity scale: acculturative stressors as an example. Res Social Work Pract. 2008;18:475–86.
15. Aprahamian M, Kaplan DM, Windham AM, Sutter JA, Visser J. The relationship between acculturation and mental health of Arab Americans. J Mental Health Counsel. 2011;33:80–92.
16. Flynn PM, Foster EM, Brost BC. Indicators of acculturation related to Somali refugee women's birth outcomes in Minnesota. J Immigr Minor Health. 2011;13:224–31.
17. Israel BA, Schulz AJ, Parker EA, Becker AB. Review of community-based research: assessing partnership approaches to improve public health. Ann Rev Public Health. 1998;19:173–202.
18. Ellis B, Kia-Keating M, Yusuf SA, Lincoln A, Nur A. Ethical research in refugee communities and the use of community participatory methods. Transcult Psychiatry. 2007;44(3):459–81.
19. Bazzino O, Monaco R, Mario B, Sergio C, Valeria C, Sergio E, et al. Management of acute coronary syndromes in developing countries: acute coronary events-a multinational survey of current management strategies. Am Heart J. 2011;162(5):852–9.
20. Fuentes-Afflick E, Hessol NA, Perez-Stable EJ. Testing the epidemiologic paradox of low birth weight in Latinos. Arch Pediatr Adol Med. 1999;153:147–53.
21. Muennig P, Fahs MC. Health status and hospital utilization of recent immigrants to New York City. Prev Med. 2002;35:225–31.
22. Caulford P, Vali Y. Providing health care to medically uninsured immigrants and refugees. Can Med Assoc J. 2006;174:1253–4.
23. Hyman I. Immigration and health. In: *Health policy working paper series.* Health Canada; 2001.
24. Stephen EH, Foote K, Hendershot GE, Schoenborn CA. Health of the foreign-born population: United States, 1989–90. Adv Data 1994:1–12.
25. Israel BA, Schulz AJ, Parker EA, Becker AB. Review of community-based research: assessing partnership approaches to improve public health. Ann Rev Pub Health. 1998;19:173–202.

26. Johnson CE, Ali SA, Shipp MPL. Building community-based participatory research partnerships with a Somali refugee community. Am J Prev Med. 2009;37:S230–6.

27. Hunt LM, Schneider S, Comer B. Should 'acculturation' be a variable in health research? A critical review of research on US Hispanics. Soc Sci Med. 2004;59:973–86.