Persian Translation and Rasch Model-Based Validation of an Intercultural Intelligence Scale

Mona Tabatabaee-Yazdi[1a], Purya Baghaee[2b]

Abstract

Culture is rooted in every aspect of human life, and more specifically in the simplest and easiest act of language to the degree that every single speech act accounts for performing a cultural act. Thus, this study aimed to validate the Persian translation of the Intercultural Intelligence Scale developed by Ang et al. (2007), using the Rasch rating scale model, to discover whether the same constructs of the scale would be extracted in order to make it available to use within the Persian language contexts. The scale was administered to 203 EFL teachers who have taught English in several language institutes and universities. Findings showed the test had an acceptable person and item separation reliability which proved the external validity of the scale. The order of the category thresholds showed the respondents could discriminate well among the scale's categories. Therefore, the scale is potentially valid and can be used as a measure of Intercultural Intelligence in the Persian language contexts.

[1] Assistant Professor, Email: tabatabaee.mona@gmail.com (Corresponding Author)
Tel: +98-915-3160799
[2] Associate Professor, Email: puryabaghaei@gmail.com
[a] English Department, Tabaran Institute of Higher Education, Mashhad, Iran
[b] English Department, Islamic Azad University, Mashhad Branch, Mashhad, Iran
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1. Introduction

In today's globalized fast-changing world, being proficient in negotiating with people of different cultural backgrounds seems to be very critical for successful communication within any type of environment. Accordingly, almost all occupational settings are going to gradually become culturally diverse which leads managers, supervisors, employees and other individuals to become more responsible and aware of the cultural values and differences while engaging in cross-cultural negotiations (Mydłowska, 2020). One of the prominent working environments largely affected by cultural differences is the educational environment (Omwami & Rust, 2020). More and more socio-cultural diversities among students have been witnessed within the educational systems, which indicate teachers should get used to playing active roles as cultural facilitators or mediators in developing students' cultural awareness and intercultural intelligence. Sometimes, these diversities in terms of age, language, race, culture, etc., put professionals into inappropriate interventions and potential misinterpretations concerning intentions, behaviors, verbal and non-verbal negotiations (Govender et al., 2017; Hammell, 2013; Tétreault et al., 2021), which in turn can affect individuals' trust and relationships. Thus, "with the globalization flow in the world, communities are more agitated about their once strongly-held possession, that is, cultural identity" (Rezaei, & Bahrami, 2019).

Besides, it is obvious that English as an international language has gained very significant status in all the educational centers throughout the world. In these settings, it is obvious that both teachers and textbooks are expected to progress various facets of students' lives (Pishghadam & Saboori, 2014). Consequently, to overcome hindrances connected to negotiations in a context of diversity, and to bring attention to prejudices and biases by advancing awareness and understanding, it seems significant to assess, reinforce, and evolve English as a Foreign Language (EFL) teachers' knowledge and abilities to interact effectively across cultures since their experiences and reflections have a direct significant impact on their own and their students' success and confidence in both their personal and professional lives (Jin, Cooper, & Golding,

2016). Therefore, to highlight the importance of intercultural diversities on Iranian EFL teachers' intercultural values and negotiations, and to make the scale available to use within the Persian language contexts, the present study aims to validate the Persian translation of the Intercultural Intelligence Scale (see Appendix 2) developed by Ang et al. (2007, see Appendix 1), using the Rasch Model. No other studies in Iran have been found to practice validation of an Intercultural Intelligence scale using Rasch model (Rasch 1960/1980), which has been used frequently to evaluate questionnaires and construct validity in the area of research and social sciences (Baghaei, 2009).

The advantage of the Rasch model over the Confirmatory Factor Analysis (CFA) is that parameters in Rasch models are not sample dependent, and "raw score is not considered to be a linear measure, transformation of raw scores into logits" (Wright, 1996, p. 10).

2. Theoretical Framework

Negotiations and exchanges are the key elements in any successful communication in today's multicultural settings (Egan, 2017; Tétreault et al., 2021). According to McDevitt (2004), there is nothing independent of the culture in people's negotiations and any kind of speech event encompasses factors regarding the culture of the interlocutors. Thus, if the interlocutors do not share relevant factors of that culture, the results might be meaningless communication. Lax and Sebenius (1986, p. 11) defined negotiation as "a process of potentially opportunistic interaction by which two or more parties, with some apparent conflict, seek to do better through jointly decided action than they could otherwise". According to this definition, many researchers (e.g., Adair & Brett, 2005; Groves, Feyerherm, & Gu, 2015; Gunia, Brett, & Gelfand, 2016; Imai & Gelfand, 2010; Ogliastri & Quintanilla, 2016) tried to investigate the process of negotiation in culturally diverse environments and the way these differences impact negotiations. Adair and Brett (2005) and Groves et al. (2015) reported that a good understanding of the diverse cultural values and behaviors is needed for successful negotiation in intercultural environments. However, Imai and Gelfand (2010) and Liu, Chua, and Stahl (2010) asserted that intercultural negotiation entails some communication difficulties, thus, negotiators in

multicultural settings should be able to not only recognize the cultural differences but also adjust their negotiation style to that cultural setting (Groves et al., 2015). Accordingly, Mahasneh, Gazo, and Al-Adamat (2019) conducted a study to examine the intercultural intelligence of both teachers and university students in order to find out any significant differences in the level of cultural intelligence due to gender variables. They reported no significant differences between teachers and university students in the metacognitive and motivation dimensions of cultural intelligence. They, however, asserted teachers got higher significant scores in cognitive and behavioral dimensions. In addition, they reported no significant difference in the level of cultural intelligence with respect to gender.

Accordingly, Intercultural Intelligence, that is, the individuals' capability to behave efficiently in multi-cultural settings in order to foster tolerance and improve intercultural interfaces (Earley, & Ang 2003; Spitzberg & Changnon, 2009), is a concept that has already been confirmed to be an important factor for management and institutional studies (Triandis, 2006). Bennett (1984, as cited in Chen & Starosta, 2000) also defined Intercultural Intelligence as individuals' ability to not only transform themselves emotionally but also cognitively and behaviorally from a denial stage to the integration stage in the evolving process of intercultural communication. Thus, interculturally intelligent persons are the ones who enjoy cultural differences by not denying the existence of cultural differences and moving to advance empathetic ability to accept and adapt to cultural variances (Chen & Starosta, 2000).

In view of that, educating teachers to make them ready for entering the intercultural settings of education with learners having different cultures and emotions has always been an important issue in the literature. For instance, Martínez (2014) discusses the necessity of giving priority to the emotional, social, and cultural competencies in teachers' education, because it leads to the creation of a framework for intercultural competence. Martinez (2014) further concluded that there are significant connections between affective skills and intercultural intelligence since both encourage communicative interaction to

advance the professional development of teachers. Moreover, Esfandiari and Nikoopour (2015), who focused on the relationship between EFL teachers' emotional, social, and cultural intelligence and successful teaching in an EFL context, reported a significant correlation between intelligence and effective teaching. They also asserted a significant difference in emotional intelligence regarding participants' gender, and a significant difference in social and emotional intelligence concerning university degree, teaching experience, and age.

Besides, culture in any kind of organization is considered as significant as an ecosystem (Bele & Hebalkar, 2019). Considering educational settings, teachers with high cultural and intercultural intelligence verify to be an asset to the organization since if they get well adapted to the intercultural intelligence, they will be able to deal with the cultural shocks in a multi-cultural environment, and can help to advance the organization's work performance (Bele & Hebalkar, 2019). Therefore, to be successful, Bhawuk and Brislin (1992, p. 416) believed teachers should be "interested in other cultures, be sensitive enough to notice cultural differences, and then also be willing to modify their behavior as an indication of respect for the people of the other cultures". Thus, since fostering intercultural intelligence at a high level can be considered as a remedy to eliminate cross-cultural misinterpretations, teachers need to advance their intercultural skills and abilities from time to time. To this aim, intercultural intelligence should be incorporated into the educational curriculum as one of the individuals' 21st century needed skills and capabilities (Delante, 2020; Menon & Narayanan, 2015; Tétreault et al., 2021; Vu, 2019). According to Bele and Hebalkar (2019, p. 85), promoting teachers' intercultural intelligence can also be achieved through "observation, interaction, experience, reading, or by pursuing training".

3. Methodology

3.1. Participants

The Persian translation of the Intercultural Intelligence Scale was administered to 203 Iranian EFL teachers (Mean$_{age}$ = 24.62, SD = 6.64; Male = 21.7%, Female = 78.3%). They were from different fields of study within the domain of English Language (Teaching English

as a Foreign Language = 79.8, English Translation=14.8, English Literature = 0.5, Others = 4.9). The participants' native language was Persian and they were all citizens of Iran. The selection was done based on availability/ convenience sampling through Google Form and the participants were ensured about research ethical considerations such as confidentiality and anonymity.

3.2. Instrument

The Persian translation of the Intercultural Intelligence Questionnaire (Ang et al., 2007) was used in this study. This four-dimensional Intercultural Intelligence Scale is a widely used questionnaire to measure teachers' cognitive, metacognitive, motivational, and behavioral intelligence. The questionnaire has 20 items on a five-point Likert scale ranging from (*Disagree strongly*) to (*Agree strongly*). Ang et al. (2007) reported acceptable fit validity indices, and alpha reliabilities of .86, .89, .85, and .86 for metacognitive, cognitive, motivational, and behavioral constructs, respectively.

The scale's *cognitive* construct consists of six items including *I know the cultural values and religious beliefs of other cultures*, measures individuals' knowledge of cultural standards, customs, values and conventions, practices, and approaches in different cultural situations. High cognitive scores illustrate a better understanding of basic cultures.

The *Metacognitive* construct, including four items such as *I check the accuracy of my cultural knowledge as I interact with people from different cultures*, measures individuals' awareness of cultural knowledge applied during cross-cultural interfaces. High Metacognitive scores indicate proper understanding and interpretations of intercultural differences.

The *Motivational* construct involves five items including *I am confident that I can socialize with locals in a culture that is unfamiliar to me,* assesses people's capability to pay attention, and measures individuals' ability to learn and act under cross-cultural situations. High Motivational scores show higher energy and self-confidence for planning and understanding needed intercultural differences.

The *Behavioral* construct, which comprises five items containing *I change my verbal behavior (e.g., accent, tone) when a cross-cultural interaction requires it*, refers to the individuals' capability to do verbal and nonverbal interaction while communicating with people from different cultures. High behavioral scores specify people's ability to involve in leadership in intercultural settings (Ang, et al., 2007; Bele & Hebalkar, 2019).

3.3. Procedure

The four-dimensional Intercultural Intelligence Questionnaire (Ang et al., 2007) was selected to be translated and validated in order to make it available to use within the Persian language contexts. The questionnaire is a widely used scale to assess teachers' cognitive, metacognitive, motivational, and behavioral intelligence concerning cultural differences. The Persian version was back-translated into English by another colleague. Next, the two English versions were studied and compared, and major inconsistencies were noted. Then, the psychometric properties of the Persian Intercultural Intelligence Scale were examined using the Rasch rating scale model.

4. Results

In educational and social sciences settings, there are a variety of statistical techniques applied to construct, assess, validate, and interpret the test's results (Samir & Tabatabaee-Yazdi, 2020; Tabatabaee-Yazdi, 2020). One of the commonly approved used procedures to confirm the validity of the questionnaires and tests in the field of social sciences is the application of the Rasch models (Baghaei, 2009). The Rasch model is a latent variable model. Therefore, if the data fit the Rasch model, it shows that there is a latent trait underlying the observed variables and there is a growing relationship between them (Baghaei & Shoahosseini, 2019). Thus, using Winsteps Rasch software version 3.73 (Linacre, 2009a), Andrich's (1978) Rating scale model was run to analyze the data set and endorse the construct validity of the test.

4.1. Individual Item Characteristics

Individual item characteristics (Table 1) showed the analysis of the fit indices. The difficulty estimates for each item and the standard error of the item difficulty measures are shown by the column labeled as *Measure* and *Model S. E.,* respectively. As the table shows, the items are set from difficult to easy.

The easiest item is item 14 and the most difficult item is item 1. It means that the difficulty of item 14 (the most difficult item) is estimated to be 0.50 logits with the standard error (SE) of 0.09. It means one can be 95% sure that the true value for the difficulty of this item lies somewhere between 0.32 to 0.68 logits, that is, two SE's below and above the observed measure. According to Bond and Fox

(2007) and Linacre (1999), *Outfit* and *Infit* Mean square (*MNSQ)* values in the range of 0.60 to 1.40 are considered acceptable for rating scales measurement. These values, which signify the existence or non-existence of construct-irrelevance variance or multidimensionality (Baghaei, 2008), indicated that all the items fit the Rasch model, and there are no misfitting items.

Table 1
Fit Statistics for the Intercultural Intelligence Scale

Items	Measure	Model S.E.	Infit MNSQ	Outfit MNSQ
1	.50	.09	1.39	1.37
19	.47	.09	1.27	1.33
3	-.07	.10	1.20	1.14
5	-.20	.10	1.20	1.16
4	.19	.09	1.10	1.11
16	-1.37	.12	1.10	1.02
20	-.49	.10	1.04	1.09
6	.89	.08	.95	1.06
17	-.37	.10	1.03	1.03
13	.24	.09	.99	1.02
9	.56	.09	.96	1.01
10	.64	.09	.92	.97
2	-.26	.10	.95	.94
11	.88	.08	.93	.94
7	.47	.09	.92	.90
12	-.25	.10	.92	.90
18	-.16	.10	.87	.86
8	.26	.09	.86	.86
15	-.89	.11	.85	.86
14	-1.05	.11	.76	.80

Moreover, the analyses of the items yielded an item difficulty range of -1.37 to 0.89 logits with a separation reliability of .97. Person estimates ranged from – 1.20 to 3.75, with separation reliability (used instead of reliability indices in Rasch analysis) of .81.

Person separation (> 0.8) specifies the ability of the instrument to distinguish between participants with high and low abilities. Item separation indicates the number of different ability or difficulty strata that the test can identify. Item separation (> 0.9) shows the number of different abilities that the test can identify (Linacre, 2009a).

4.2. Response Scale Analyses

Table 2 shows the Rating Scale Structure properties (Category Statistics) for the five-point scale of the test. The third column in Table 2 (category observed average) shows the mean of all participants who chose that category. The observed averages should be

increased along with category values, which is the pattern detected in this study. The infit and outfit MNSQs are expected to be around the value of 1.0; values above 1.50 are problematic (Linacre, 2009a), which is again the pattern detected in this study. The thresholds column clarified the rating scale points where the possibility of being observed in either of two neighboring categories is equal. The order of the thresholds is expected to increase with category values (Bond & Fox, 2007; Linacre, 1999). Although disordered thresholds do not violate Rasch models, they impact the clarification of how the rating scale functions (Linacre, 1999). To resolve this issue, it is advised to minimize the number of response categories by eliminating the neighboring categories (Bond & Fox, 2007; Linacre, 1999). The study's threshold estimates were shown to be in order (-2.00, -.44, -.05, 2.49), indicating that the participants were able to differentiate among categories well, thus there is no need to break down rating scale categories.

Table 2
Category Statistics for Intercultural Intelligence Scale

Category	Count (%)	Observed average	Infit MNSQ	Outfit MNSQ	Threshold
1 Disagree strongly	83	-.16	1.26	1.38	-
2 Disagree	473	-.03	1.04	1.05	-2.00
3 Neither agree nor disagree	855	.32	.99	.99	-.44
4 Agree	1724	.92	.99	.95	-.05
5 Agree strongly	545	1.89	.90	.93	2.49

The probability curves, which should look like a range of hills, for each response category were shown in Figure 1. The peak of each category demonstrates that each category symbolizes a single sector of the measured construct. Categories with no peaks signify disordered Rasch-Andrich thresholds (Linacre, 2009b). In this study, all the categories were shown to have a peak on the curve, thus, each category symbolizes a single unit of the measured construct.
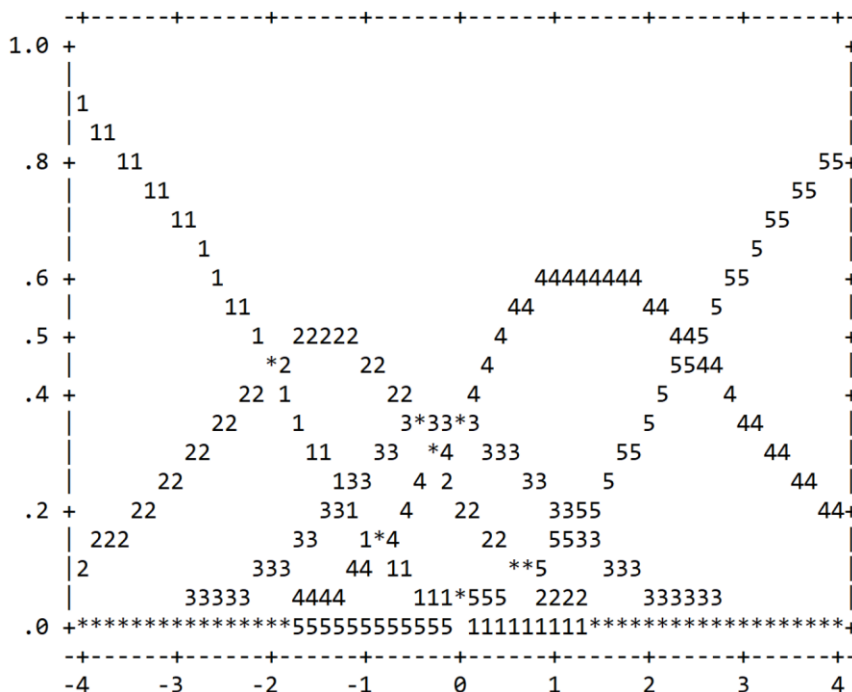
Figure 1
Category Probabilities curve for Intercultural Intelligence Scale

4.3. Item-Person Map

Item-person map (Figure 2) proves the content validity of the test by providing evidence for the representativeness of the items. The map specifies the idea that item difficulty and person ability estimates are conveyed on the same metric. Numbers on the right side of the map illustrate items and # on the left signify persons. Items should be situated along the whole scale to significantly measure the 'ability' of all persons (Bond & Fox, 2007). Items and persons positioned on top of the map are more difficult and more capable, meaning that moving towards the bottom of the map, the endorsability of the items decreases. Therefore, participants on top of the map endorse a higher level of cultural intelligence. As the figure illustrates, because of the gap on the higher end of the map, more items are needed at that end for a better person ability estimation.

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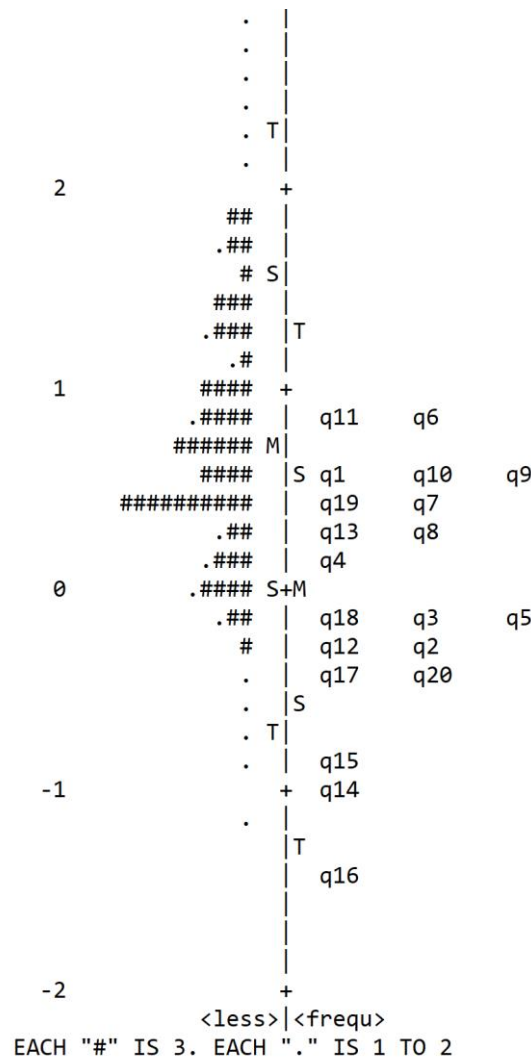
Figure 2
Item-Person Map

4.4. Gender DIF

According to Lord (1980) and Baghaei and Cassady (2014), differential item functioning (DIF), showing violation of items' variance across different samples, is considered as evidence of the item bias. In this study, gender DIF showed that there is no biased item against gender on the Intercultural Intelligence Scale, which means both male and female participants function in the same way to answer the test's items.

5. Discussion

Intercultural studies (e.g., Beagan, 2015; Cai, 2016; Hall & Theriot, 2016; Kohli, Huber, & Faul, 2010; Murden et al., 2008; Tétreault et al., 2021) have shown that to provide effective services and to treat everyone in an appropriate

way, cultural differences in educational settings need to be recognized. Besides, some researchers (e.g., Beagan, 2015; Cai, 2016; Henderson, Horne, Hills, & Kendall, 2018; Reyneke, 2017; Tétreault et al., 2021) believe that for some participants, it is difficult to become aware of their cultural differences; therefore, investigating teachers' intercultural awareness, as well as intercultural intervention training, seems to be essential to develop the intercultural competence. Accordingly, the present study aimed to validate the Persian translation of the Intercultural Intelligence Scale developed by Ang et al. (2007), using the Rasch rating scale model, to discover if the Persian scale enjoys the same underlying constructs as the original one.

The overall findings indicated that the test can act and be considered as an efficient measure in the Persian language. The test had an acceptable person and item separation reliability which proved the external validity of the scale. There was not any misfitting item nor any biased item across gender. The order of the category thresholds showed that the respondents could discriminate well between the scale's categories.

This study like any other scientific study suffered from some limitations. The most important one was the sampling procedure that was based on convenience sampling through online data gathering. Therefore, it should be taken into account that teachers who were most interested in the topic of cultural diversity may have participated in this study. Moreover, this study covered a sample of Iranian EFL teachers. The findings of this study could also be of value for other practitioners in educational settings. Other future research can be conducted to investigate the relationship between cultural intelligence and employability, or students' success and performance behavior. Moreover, studies can be done to detect the cultural intelligence among students and organizational employees. Teachers and students can become aware of their own values, beliefs, thinking patterns, and biases; and in turn learn how to adapt their interventions (Murden et al., 2008).

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Appendices

Appendix 1
The Intercultural Intelligence Scale (English Version)

Please read each statement and select the response that best describes your capabilities. Select the answer that BEST describes you AS YOU REALLY ARE (1 = strongly disagree; 5 = strongly agree).

Constructs			1	2	3	4	5
Behavioral	1	I change my verbal behavior (e.g., accent, tone) when a cross-cultural interaction requires it.					
	2	I use pause and silence differently to suit different cross-cultural situations.					
	3	I vary the rate of my speaking when a cross-cultural situation requires it.					
	4	I change my nonverbal behavior when a cross-cultural situation requires it.					
	5	I alter my facial expressions when a cross-cultural interaction requires it.					
Cognitive	6	I know the legal and economic systems of other cultures.					
	7	I know the rules (e.g., vocabulary, grammar) of other languages.					
	8	I know the cultural values and religious beliefs of other cultures.					
	9	I know the marriage systems of other cultures.					
	10	I know the arts and crafts of other cultures.					
	11	I know the rules for expressing nonverbal behaviors in other cultures.					
Metacognitive	12	I am conscious of the cultural knowledge I use when interacting with people with different cultural backgrounds.					
	13	I adjust my cultural knowledge as I interact with people from a culture that is unfamiliar to me.					
	14	I am conscious of the cultural knowledge I apply to cross-cultural interactions.					
	15	I check the accuracy of my cultural knowledge as I interact with people from different cultures.					
Motivational	16	I enjoy interacting with people from different cultures.					
	17	I am confident that I can socialize with locals in a culture that is unfamiliar to me.					
	18	I am sure I can deal with the stresses of adjusting to a culture that is new to me.					
	19	I enjoy living in cultures that are unfamiliar to me.					
	20	I am confident that I can get accustomed to the shopping conditions in a different culture.					

Appendix 2
The Intercultural Intelligence Scale (Persian Version)

پرسشنامه هوش بین فرهنگی

همکار گرامی،
این پرسشنامه شامل برای سنجش هوش بین فرهنگی طراحی شده است. لطفا جملات را بخوانید و با دقت و صداقت میزان موافقت خود را با هر یک از موقعیت‌های داده شده مشخص کنید. پاسخ‌های شما محرمانه باقی خواهد ماند.
با تشکر

کاملا مخافم	مخالفم	نظری ندارم	موافقم	کاملا موافقم			
					در صورت نیاز برای تعامل با افرادی از فرهنگ‌های دیگر، رفتار کلامی خود (مثلاً لهجه، لحن) را تغییر می‌دهم.	۱	رفتاری
					متناسب با موقعیت‌های فرهنگی متفاوت، از مکث و سکوت به طرز متفاوتی استفاده می‌کنم.	۲	

						در صورت نیاز برای تعامل با افراد فرهنگ‌های دیگر سرعت صحبت خود را تغییر می‌دهم.	۳	
						در صورت نیاز برای تعامل با افراد فرهنگ‌های دیگر رفتار غیر کلامی خود را تغییر می‌دهم.	٤	
						در صورت نیاز برای بیان مفاهیم و ایجاد تعامل با افراد فرهنگ‌های دیگر، حالات چهره‌ی خود را تغییر می‌دهم.	٥	
						با نظام حقوقی و اقتصادی سایر فرهنگ‌ها آشنا هستم.	٦	
						با قوانین سایر زبان‌های آشنا هستم (مثلاً واژگان، دستور زبان).	۷	
						با ارزش‌های فرهنگی و اعتقادات مذهبی سایر فرهنگ‌ها آشنا هستم.	۸	
						با آداب و رسوم ازدواج سایر فرهنگ‌ها آشنا هستم.	۹	
						با آثار هنری و صنایع دستی سایر فرهنگ‌ها آشنا هستم.	۱۰	
						با قوانین رفتارهای غیرکلامی در فرهنگ‌های دیگر آشنا هستم.	۱۱	
						هنگام تعامل با افراد سایر فرهنگ‌ها، از تفاوت‌های بینافرهنگی آشنا هستم.	۱۲	
						هنگام تعامل با افرادی از فرهنگ‌های ناآشنا، دانش فرهنگی خود را با آن‌ها تطبیق می‌دهم.	۱۳	
						هنگام تعامل با افراد سایر فرهنگ‌ها، به اطلاعات و دانش فرهنگی که استفاده می‌کنم، دقت می‌کنم.	۱٤	
						هنگام تعامل با افراد سایر فرهنگ‌ها، از درستی اطلاعات فرهنگی خود اطمینان حاصل می‌کنم.	۱٥	
						از تعامل با افراد سایر فرهنگ‌ها لذت می‌برم.	۱٦	
						مطمئنم می‌توانم با مردم محلی سایر فرهنگ‌های ناآشنا، ارتباط برقرار کنم.	۱۷	
						مطمئنم می‌توانم خود را با استرس‌های ناشی از مواجهه و سازگاری با فرهنگی جدید وفق دهم.	۱۸	
						از زندگی میان افرادی با فرهنگ‌های ناآشنا لذت می‌برم.	۱۹	
						مطمئنم می‌توانم به شرایط و نحوه‌ی خرید در یک فرهنگ متفاوت عادت کنم.	۲۰	