

REVIEW ARTICLE



A multi-national validity analysis of the Personal Report of Communication Apprehension (PRCA-24)

Stephen M. Croucher^a, Stephanie Kelly^b, Diyako Rahmani^a, Kelsea Jackson^a, Flora Galy-Badenas^a, Agnes Lando^c, Monica Chibita^d, Venantie Nyiranasbimana^e, Elira Turdubaeva^f, Nadirabegim Eskiçorapçı^g, Shawn Michael Condon^a, Gulzada Stanaliev^h and Bakyt Orunbekov^h

^aSchool of Communication, Journalism, and Marketing, Massey University, Wellington, New Zealand; ^bDepartment of Business Education, North Carolina A&T University, Greensboro, NC, USA; ^cCommunications, Daystar University, Nairobi, Kenya; ^dMass Communication Department, Uganda Christian University, Kampala, Uganda; ^eCommunication, Institut Catholique de Kabgayi-Rwanda, Kabgayi, Rwanda; ^fDepartment of Journalism and Mass Communication, American University of Central Asia, Bishkek, Kyrgyzstan; ^gPublic Relations and Publicity Department, Yeditepe University, Istanbul, Turkey; ^hJournalism Department, Kyrgyz-Turkish Manas University, Bishkek, Kyrgyzstan

ABSTRACT

Methodological issues abound when conducting cross-cultural research. In this manuscript we discuss three methodological issues present in many cross-cultural communication studies: lack of geographic diversity, reliability, and validity. To explore these issues the Personal Report of Communication Apprehension (PRCA-24) is assessed. The PRCA-24 serves as an exemplar of a US-designed and -validated measure frequently used outside the US without tests of validity or measurement invariance. In fact, since 1990 less than 10 studies have reported validity results, often citing fit issues. The PRCA-24 was administered to respondents from 11 countries and failed to yield acceptable fit statistics in all samples, showing poor construct validity. Implications for cross-cultural research are discussed, with particular emphasis on recommendations for increased cross-cultural methodological rigor.

ARTICLE HISTORY

Received 9 November 2018
Accepted 30 March 2019

KEYWORDS

Communication apprehension; PRCA-24; confirmatory factor analysis; validity; reliability

Cross-cultural communication is a diverse field of inquiry. Croucher (2016) defined cross-cultural communication as the study/comparison of the same phenomena in different cultures. As the field of cross-cultural communication has grown extensively in its theoretical and methodological depth since its first systematic review (1974), numerous methodological issues have emerged. Seibold, Rubin, and Rubin (2009) identified various methodological issues that affect how cross-cultural communication research is conducted and constructs measured: parsing culture-level effects, individual and cultural differences, equivalency, language, technology, lack of geographic diversity in studies, reliability, and validity. If not addressed properly, these methodological issues have an array of adverse effects on the research process and results (Croucher & Kelly, *in press*).

In this piece, we focus on the effects of three of these issues: lack of geographic diversity in studies, reliability, and validity. To explore these methodological issues, the Personal Report of Communication Apprehension-24 (PRCA-24) (McCroskey, 1982) is assessed. The PRCA-24 was developed in the United States, among a Gen X US-student sample. The scale is regularly used to assess communication apprehension (CA) in non-US samples and in cross-cultural studies to assess and

compare CA (Croucher & Kelly, *in press*; Seibold et al., 2009). The purpose of this paper is not to examine the conceptualization of CA or apprehension. Rather, the purpose of this paper is to use the PRCA-24, one of the most widely used measures in communication, to better understand cross-cultural communication methodological issues. In the next section, cross-cultural measurement issues/concerns are discussed: the effects of a lack of geographic diversity in studies and reliability/validity concerns.

Cross-cultural measurement issues and concerns

As a field, cross-cultural communication is largely US and East Asian centric (Croucher, 2017; Croucher & Kelly, *in press*). There are very few studies in African, Central Asian, European, and/or Middle Eastern contexts, which demonstrate cross-cultural communication's limited understanding outside of the US and East-Asia. Moreover, most measures have been designed by US-based and -trained researchers and largely validated among US college/university students. Generalizations outside of this particular population should be done with caution (Croucher & Kelly, *in press*). For a more nuanced understanding of communication, it is essential to study communication in different parts of the world.

Many measures validated in the US have been adapted for non-US contexts. This is typically done through direct translation. Aside from linguistic equivalence (Gudykunst, 2003), other reliability and validity issues can arise when adapting a measure. First, it has been common practice in cross-cultural research to assess a measure as a 'quality' measure using Cronbach's alpha in lieu of a validity portfolio. Many older measures were assessed as strong, reliable, and in some cases 'valid' because they had a high reliability score. Researchers have known for many years that a Cronbach's alpha reliability score can be misleading, given that the score is dependent upon the number of items in a measure (Peterson, 1994). Previously, if items in a measure looked appropriate (face validity) and the measure had a high reliability score, many researchers assumed or stated it was reliable and valid, even with validity not being demonstrated. Such practice has resulted in invalid measures and questionable results (Croucher & Kelly, *in press*).

Second, many older measures (such as the PRCA-24) do not have a cross-cultural validity portfolio. Validity for some of these measures may have been established among a particular sample, often students at Research X, a primarily white university (Violanti, Kelly, Garland, & Christen, 2018). However, there is limited evidence that measures used in cross-cultural contexts work outside of the population they were designed to assess. This means the validity evidence provided could be mainly a generational or sub-cultural phenomenon (Autman & Kelly, 2017; Croucher & Kelly, *in press*). Recently, new statistical software has been developed to more easily assess content validity of measures, meaning that it is no longer difficult to examine the factor structures of measures before use.

Third, the role of connotative versus denotative translations must be carefully considered when conducting cross-cultural research. Whether a study is being conducted in the same language or not, the measure must be reviewed extensively by native speaker(s) to ensure connotative meanings are clear. In the PRCA-24 for example, the term 'acquaintance' is used. If this term is translated into Spanish, which it has in the past for CA research (reference here), the term would more than likely be translated into 'persona conocida,' which directly translates into 'known person,' which can also mean 'familiar person.' This subtle difference could create misunderstandings for respondents when completing the PRCA-24, which would in turn affect validity (Croucher & Kelly, *in press*).

Fourth, measures often include references to contexts that are untranslatable, unknown, obscure, irrelevant, comical, etc., to new generations of respondents or respondents not from the original validated population. Many instructional measures reference a physical textbook, which many students today have never purchased. The Willingness to Communicate Scale (McCroskey, 1992) references a garbage collector, someone many people may never have spoken to in their lives. Croucher and Kelly (*in press*) stated that cross-cultural communication is methodologically diverse. However, they urged exploration into our understanding of the validity of seminal measures. What follows is a description of communication apprehension and the PRCA-24.

Communication apprehension and the PRCA-24

Communication apprehension (CA) is 'an individual's level of fear or anxiety associated with either real or anticipated communication with another person or persons' (McCroskey, 1977, p. 78). Trait CA reports anxiety across four communication contexts: dyadic, meeting, public, and small groups. CA is normally measured with the Personal Report of Communication Apprehension (PRCA-24) (McCroskey, 1982). The PRCA-24 includes 24 statements that measure trait-like CA. Respondents are asked to rate their level of agreement with each statement using a 5-point Likert-type scale. Scores on the PRCA-24 range from 24 to 120, with lower scores indicating lower levels and higher scores indicating higher levels of apprehension. In studies conducted among United States samples (mainly university/college students), researchers have reported the PRCA-24 to have high internal consistency, with alpha reliabilities ranging from .80 to .95 (Allen, Long, O'Mara, & Judd, 2008; Dwyer, 1998; Hsu, 1998; Levine & McCroskey, 1990; Martin, Valencic, & Heisel, 2002; McCroskey, Beatty, Kearney, & Plax, 1985; Teven, Richmond, McCroskey, & McCroskey, 2010). Data from US samples have also supported the construct, content, and criterion-related validity of the PRCA-24 (Beatty, 1987, 1988; Beatty, Frost, & Stewart, 1986; Levine & McCroskey, 1990; McCroskey et al., 1985).

While the PRCA-24 has been shown to be a highly reliable and valid measure of CA in US samples, researchers have increasingly adapted the measure to measure CA in non-US samples. As such, questions of measurement invariance and psychometric properties of the PRCA-24 are critical. Gudykunst (2003) argued correlations between scale items will differ significantly in one culture versus another, which will affect reliabilities and validity results. He added that 'reliability and validity must be established within each culture separately' (p. 156). Additionally, Levine and McCroskey (1990) stated, 'since the results of social scientific research are only as valid as the measurement used to obtain the results, understanding the psychometric properties of our measures is critical. This is particularly important for frequently used measures' (p. 63), such as the PRCA-24.

PRCA-24 validity in non-US samples

While the PRCA-24 has shown internal consistency and data has supported the scale's construct, content, and criterion-related validity in US samples (McCroskey et al., 1985; McCroskey & Beatty, 1984; Rubin, Graham, & Mignerey, 1990), research conducted outside the US using the PRCA-24, has shown considerable variation in reliability results and validity testing has been sporadic at best. Since 1990, more than 60-peer reviewed articles have been published including data collected using the PRCA-24 administered on non-US samples. The [Appendix](#) includes a list of the articles reviewed for this analysis. Less than 10 articles have reported results of validity testing, with mixed results. In a research line exploring communication traits and orientations, Hsu (2002, 2004) had investigated communication apprehension in the US and Taiwan. In each study, Hsu conducted principal components analysis on a Mandarin version of the PRCA-24, which revealed four components for the PRCA-24: speaking in public, groups, meetings, and dyads. In an analysis in the French context, Croucher (2013) conducted an exploratory factor analysis, revealing the same four components for the PRCA-24.

Other research has found structural issues with the PRCA-24. Hsu (2007) found confusion among Taiwanese respondents as to whether the PRCA-24 was a four or three factor structure. In particular, there was confusion between the group and meeting dimensions, in which items cross-loaded on the two dimensions. Hsiao (2010) also tested rival measurement models of the PRCA-24 in Taiwan. The researcher found through confirmatory factor analysis (CFA), the maximum likelihood that a four-factor structure did not generate an acceptable fit. Moreover, testing of discriminant validity suggested Taiwanese university students do not differentiate the meeting setting from the group, dyadic or public speaking settings. Hsiao (2010) also suggested paying particular attention to items 1, 4, 13, and 18, as removing these items significantly improved the comparative fit indexes (CFIs).

In the Japanese context, researchers have reported numerous structural issues with PRCA-24. Pribyl, Keaten, Sakamoto, and Koshikawa (1998) subjected the PRCA-24 to principal-components analysis using varimax rotation. The analysis revealed four factors; however, loadings on the meeting and group factors were inconsistent with previous research from US samples. In fact, 'an unrotated factor analysis indicated that all but four questions (2, 4, 16, 17) loaded on the first dimension' (Pribyl et al., 1998, p. 49). The authors concluded that the 'archetypal four-factor structure of the PRCA-24 did not emerge intact. This fact brings into question the content validity of the PRCA-24 in Japan' (p. 51).

In the Singaporean context, Croucher, Rahmani, Hample, and Sakkinen (2016) concluded the PRCA-24 lacked validity. The researchers conducted a CFA on a 4-factor PRCA-24, which produced a poor fit. A second order CFA then assigned each of the four latent subscales to a second order, but failed to run because the key matrix was not positive definite. Inspection showed a high likelihood of multicollinearity, especially among the group and meetings items. A third CFA assigned all 24 items to a single factor; this was also unsatisfactory.

Such questions surrounding the validity of the PRCA-24 in non-US settings were first seriously questioned by Levine and McCroskey (1990). In their analysis of rival measurement models of the PRCA-24, it was found that Spanish-language data collected in Puerto Rico deviated substantially from the second-order model. Thus, the results of their study led them to question the use of the PRCA-24 in intercultural research. Specifically, Levine and McCroskey (1990) stated,

While the results based on one sample from one culture should not be used to damn the results of previous research using the PRCA-24 in intercultural contexts, these results do warrant caution in this area. It is quite possible that the CA construct and measure cannot be translated into the language and culture of some other groups around the world. Furthermore, this implication may well extend to the cross-cultural use of other measurement instruments validated within a single culture. In such cases, additional cross-cultural measurement work is surely warranted. (p. 71)

Since 1990, and Levine and McCroskey's call for more cross-cultural measurement work and caution on use of the PRCA in intercultural/cross-cultural contexts, researchers have generally relied solely on Cronbach's alpha as the sole test of quality. Moreover, when the 'strong' validity of the PRCA-24 is cited in intercultural/cross-cultural studies, the research used for justification either did not test validity in intercultural/cross-cultural contexts, or in some cases cautioned against using the PRCA-24 in intercultural/cross-cultural contexts (e.g. Levine & McCroskey, 1990; McCroskey, 1982; McCroskey et al., 1985; McCroskey & Beatty, 1984). Thus, to answer the call put forth by Levine and McCroskey (1990), the current study explores the PRCA-24's validity in different national contexts. To be clear, this paper does not critique the conceptualization of CA, but examines the operationalization of CA in the PRCA-24. Moreover, it is not the intention of this study, as Levine and McCroskey (1990) said, 'to damn the results of previous research using the PRCA-24 in intercultural contexts' (p. 71). Instead, our measures must be open to scrutiny and empirical testing. 'Since the results of social scientific research are only as valid as the measurement used to obtain the results, understanding the psychometric properties of our measures is crucial. This is particularly important for frequently used measures' (like the PRCA-24) (Levine & McCroskey, 1990, p. 63). Specifically, the following research question is put forth:

RQ: To what extent does the Personal Report of Communication Apprehension - 24 exhibit evidence of reliability and content validity in multi-national contexts?

Method

Research locations

The research sites for this study were England, Finland France, Germany, India, Iran, Kyrgyzstan, New Zealand, Rwanda, Spain, and the United States. Data were collected in the US from both an adult sample and college/university sample. As the PRCA-24 was developed to assess CA among

college/university students, the US student sample served as the control group for comparison. England, Finland, France, Germany, and New Zealand were chosen to represent more individualistic nations and under-represented European and/or Australasian nations in communication studies. Rwanda, Uganda, Kyrgyzstan, India, and Iran were included to add to our limited understanding of communication behaviors, traits, and processes in African, post-Soviet, South Asian and West Asian cultures.

These nations differ on Hofstede's individualism/collectivism dimension. Previous research has shown that communication apprehension tends to be higher in collectivistic and lower in individualistic cultures (Burroughs, Marie, & McCroskey, 2003; Hsu, 2004). England, Finland, France, Germany, New Zealand, Spain and the US tend toward individualism, India and Iran tend toward collectivism. Kyrgyzstan has not been measured using Hofstede's measures; however, research suggests Kyrgyz peoples tend toward a more collectivistic culture (Hackman, Ellis, Johnson, & Staley, 1999; Kuchukeeva & O'Loughlin, 2003). There is no empirical research on Rwanda; however, its placement among African nations might suggest its peoples to be more collectivistic. Training offered for communication skills and perception of what is effective communication differs across and within these national groups. England, New Zealand, and the US have a long history of oral communication training and oral communication competence/willingness to communicate is highly promoted (Andrew, 1996; Croucher, Sommier, Rahmani, & Appenrodt, 2015; Hackman & Barthel-Hackman, 1993; Hassall, Joyce, Ottewill, Arquero, & Donoso, 2000). Finland, Germany, France, and Spain have relatively little training offered for oral communication (Croucher, 2013; Croucher et al., 2015; Lahuerta, 2014). In Finland, effective communicators are generally those deemed as more modest communicators (Pörhölä, 1997), in Germany effectiveness is more direct communication (Croucher et al., 2015), while in France and Spain there is little empirical research on what is 'effective' communication (Croucher, 2013; Lahuerta, 2014). In India, there is relatively little oral skills training, but Pederson, Tkachuk, and Allen (2008) asserted the context of communication, between whom the communication takes place significantly influences apprehension of the communicator. With an increased focus on English language training, there is an increased emphasis on communicative competence and reducing apprehension in Iran (Zarrinabadi, 2012). Empirical examinations of communication apprehension have yet to be conducted on Kyrgyz and/or Rwandan samples. However, as previously mentioned, their relatively collectivistic nature would suggest a higher level of apprehension and a higher tendency to approach communication with a group orientation.

Procedures and participants

A total of 12 samples were collected ($n = 2979$). Individuals were recruited between 2015 and 2017 to complete a 3–4-page survey assessing communication traits and demographic questions. In 8 of the samples (England, Finland, France, Germany, India, Iran, Kyrgyzstan, Rwanda, Spain, US-students) surveys were distributed via paper-and-pencil collection method to social networks, friends, family members, co-workers, neighbors, and among college/university students in the US. In two of the samples (New Zealand and the US-adult), surveys were distributed via Qualtrics to random adult participants. Descriptive statistics are broken down by sample in [Table 1](#).

The instrument was translated from English into Russian, Finnish, French, German, Spanish, and Kurdish by native speakers of each language. The translations were then back translated by professional translators. The reliability of the translations was calculated with the assistance of linguists in each language. The kappa values, all exceed the .70 threshold recommended for translation reliabilities (Fleiss, 1981; Gwet, 2014).

Instrument

The Personal Report of Communication Apprehension (PRCA) has 24 items that measures trait-like CA across four contexts: group, public speaking, meeting, and dyadic (McCroskey, 1982). The

Table 1. Sample overview.

Country	N	Sex		Average age
		Male	Female	
Finland	114	63	51	31.89 (SD = 11.30)
France	175	62	113	27.05 (SD = 10.04)
Germany	266	103	163	27.99 (SD = 10.48)
India	366	177	189	21.46 (SD = 1.97)
Iran	150	86	64	34.35 (SD = 9.54)
Kyrgyzstan	339	97	239	21.01 (SD = 5.32)
New Zealand	210	105	105	45.17 (SD = 15.43)
Rwanda	119	63	56	26.92 (SD = 9.45)
Spain	142	64	78	29.77 (SD = 9.47)
UK	336	163	156	26.71 (SD = 4.85)
US (adult)	312	162	150	41.6 (SD = 15.11)
US (student)	450	268	182	21.01 (SD = 1.96)

Note: Mismatch between male and female totals vs. sample size is a result of participants choosing not to disclose their sex.

measure typically uses a five-point or seven-point Likert type-scale ranging from *strongly agree* to *strongly disagree*. Because not all data for this study was retrieved for the purpose of a validity assessment, both the five- and seven-point response ranges are represented, with the US adult and New Zealand samples using seven-point scales and all other samples using five-point scales. Sample items include: 'I dislike participating in group discussions,' 'I am afraid to express myself at meetings,' 'I have no fear of speaking up in conversations,' and 'I feel relaxed while giving a speech.' While many researchers report the reliabilities and results of each context separately, the four constructs can be combined for a measure of global trait CA (Levine & McCroskey, 1990).

Results

Confirmatory factor analyses (CFA) are often used to test the content validity of a measure within each sample by confirming the hypothesized factor structure. The PRCA-24 was subjected to CFA in each sample using the AMOS maximum likelihood parameter estimation algorithm, using the recommended second-order unidimensional factor model structure (Levine & McCroskey, 1990). As shown in Table 2, the fit statistics were consistently poor. Minimally acceptable fit statistics include Goodness of Fit (GFI) and Comparative Fit Indices (CFI) of .9 or higher, Root Mean Square Error Approximations (RMSEA) less than or equal to .1, and Standardized Root Mean Square Residual (SRMR) less than or equal to .08 (Byrne, 2016). None of the measures met the minimum threshold for all four fit statistics. Only Iran met the minimum threshold for two of the first statistics (RMSEA = .09, SRMR = .08). Iran also had good descriptive statistics and high reliability as shown in Table 3. In fact, all samples yielded good fit statistics except New Zealand, which showed evidence of

Table 2. Fit statistics.

	GFI	CFI	RMSEA	SRMR	χ^2
Finland	.63	.73	.15	.16	$\chi^2(248, N = 114) = 860.92, p < .001$
France	.52	.73	.19	.16	$\chi^2(248, N = 175) = 1866.85, p < .001$
Germany	.50	.67	.20	.19	$\chi^2(248, N = 266) = 2839.88, p < .001$
India	.51	.70	.22	.22	$\chi^2(248, N = 366) = 4425.31, p < .001$
Iran	.77	.79	.09	.08	$\chi^2(248, N = 150) = 528.64, p < .001$
Kyrgyzstan	.67	.57	.11	.12	$\chi^2(248, N = 339) = 1210.62, p < .001$
New Zealand	.58	.82	.13	.07	$\chi^2(248, N = 210) = 1082.46, p < .001$
Rwanda	.45	.56	.20	.16	$\chi^2(248, N = 119) = 1445.11, p < .001$
Spain	.49	.77	.22	.13	$\chi^2(248, N = 142) = 1936.86, p < .001$
UK	.56	.77	.20	.15	$\chi^2(248, N = 336) = 3380.21, p < .001$
US (adult)	.41	.62	.16	.21	$\chi^2(248, N = 312) = 2261.35, p < .001$
US (student)	.49	.79	.21	.08	$\chi^2(248, N = 450) = 5310.87, p < .001$

Table 3. Descriptive statistics for CA by sample.

	<i>M</i>	<i>SD</i>	Skewness	Kurtosis	<i>α</i>	Language and κ (where applicable)
Finland	2.91	.31	-.15	-.64	.37	Finnish ($\kappa = .72$)
France	3.86	.85	-1.18	.82	.94	French ($\kappa = .75$)
Germany	4.01	.74	-1.81	2.82	.90	German ($\kappa = .90$)
India	3.89	.89	-.61	-.30	.95	English
Iran	3.52	.52	-.17	-.003	.84	Kurdish ($\kappa = .71$)
Kyrgyzstan	3.25	.56	.20	.47	.85	Russian ($\kappa = .80$)
New Zealand	4.07	.40	2.18	8.67	.97	English
Rwanda	3.52	.76	-.43	-.64	.91	French ($\kappa = .75$)
Spain	3.67	.94	-.88	-.57	.94	Spanish ($\kappa = .82$)
UK	3.80	.81	-.72	-.50	.93	English
US (adult)	3.86	1.29	-.89	-.45	.93	English
US (student)	3.56	1.03	-.76	-1.02	.95	English

skewness and kurtosis, and Finland, which yielded a low reliability score. Overall, results reveal the PRCA-24 exhibited poor measurement invariance across national contexts.

To better understand the misfit of the measure across cultures, the sub-measures were next examined as unidimensional. Fit statistics for these sub-measures are displayed in Tables 4–7, and descriptive statistics are displayed in Tables 8–11. Given the second-order unidimensional nature of the measure, the four sub-measures can be used independently or combined to understand CA in a particular context (Levine & McCroskey, 1990). When looking at the fit statistics of the individual sub-measures, it is notable that in several cases the sub-measures only have misfit indicated by elevated RMSEA. As an example of this, note the fit of Finland for public speaking apprehension in Table 7. Of the fit statistics, RMSEA is most dependent on the chi-square test and therefore most sensitive to minor misfit, which in some cases can be accounted for by the

Table 4. Fit statistics – group apprehension.

	GFI	CFI	RMSEA	SRMR	χ^2
Finland	.90	.95	.16	.04	$\chi^2(9, N = 114) = 34.67, p < .001$
France	.88	.97	.19	.01	$\chi^2(9, N = 175) = 66.75, p < .001$
Germany	.80	.93	.27	.06	$\chi^2(9, N = 266) = 182.85, p < .001$
India	.97	.99	.10	.01	$\chi^2(9, N = 366) = 39.34, p < .001$
Iran	.94	.91	.13	.06	$\chi^2(9, N = 150) = 250.35, p < .001$
Kyrgyzstan	.79	.61	.28	.16	$\chi^2(9, N = 339) = 1210.62, p < .001$
New Zealand	.89	.92	.19	.05	$\chi^2(9, N = 312) = 76.30, p < .001$
Rwanda	.84	.87	.24	.08	$\chi^2(9, N = 119) = 71.98, p < .001$
Spain	.78	.95	.27	.01	$\chi^2(9, N = 142) = 104.49, p < .001$
UK	.90	.97	.21	.01	$\chi^2(9, N = 336) = 130.57, p < .001$
US (adult)	.79	.68	.28	.17	$\chi^2(9, N = 312) = 226.43, p < .001$
US (student)	.69	.93	.34	.03	$\chi^2(9, N = 450) = 483.34, p < .001$

Table 5. Fit statistics – interpersonal apprehension.

	GFI	CFI	RMSEA	SRMR	χ^2
Finland	.86	.83	.21	.08	$\chi^2(9, N = 114) = 52.27, p < .001$
France	.92	.94	.16	.07	$\chi^2(9, N = 175) = 49.41, p < .001$
Germany	.85	.79	.24	.13	$\chi^2(9, N = 266) = 146.89, p < .001$
India	.77	.79	.31	.10	$\chi^2(9, N = 366) = 326.30, p < .001$
Iran	.94	.86	.12	.08	$\chi^2(9, N = 150) = 29.43, p < .001$
Kyrgyzstan	.86	.53	.22	.15	$\chi^2(9, N = 339) = 150.92, p < .001$
New Zealand	.77	.83	.28	.08	$\chi^2(9, N = 210) = 155.37, p < .001$
Rwanda	.79	.72	.28	.15	$\chi^2(9, N = 119) = 93.05, p < .001$
Spain	.74	.82	.33	.11	$\chi^2(9, N = 142) = 147.48, p < .001$
UK	.84	.83	.26	.09	$\chi^2(9, N = 336) = 200.07, p < .001$
US (adult)	.74	.65	.33	.21	$\chi^2(9, N = 312) = 312.47, p < .001$
US (student)	.71	.81	.37	.06	$\chi^2(9, N = 450) = 568.44, p < .001$

Table 6. Fit statistics – meeting apprehension.

	GFI	CFI	RMSEA	SRMR	χ^2
Finland	.81	.84	.26	.07	$\chi^2(9, N = 114) = 76.26, p < .001$
France	.65	.71	.49	.08	$\chi^2(9, N = 175) = 390.80, p < .001$
Germany	.75	.83	.36	.09	$\chi^2(9, N = 266) = 314.40, p < .001$
India	.66	.79	.44	.08	$\chi^2(9, N = 366) = 656.72, p < .001$
Iran	.90	.81	.18	.08	$\chi^2(9, N = 150) = 50.32, p < .001$
Kyrgyzstan	.90	.70	.17	.11	$\chi^2(9, N = 339) = 99.73, p < .001$
New Zealand	.78	.73	.31	.12	$\chi^2(9, N = 210) = 155.37, p < .001$
Rwanda	.78	.73	.31	.12	$\chi^2(9, N = 119) = 113.24, p < .001$
Spain	.54	.66	.76	.09	$\chi^2(9, N = 142) = 748.43, p < .001$
UK	.52	.67	.73	.09	$\chi^2(9, N = 336) = 1533.51, p < .001$
US (adult)	.74	.65	.33	.21	$\chi^2(9, N = 312) = 312.47, p < .001$
US (student)	.52	.62	.78	.11	$\chi^2(9, N = 450) = 2464.85, p < .001$

Table 7. Fit statistics – public speaking apprehension.

	GFI	CFI	RMSEA	SRMR	χ^2
Finland	.94	.94	.13	.08	$\chi^2(9, N = 114) = 25.30, p = .003$
France	.86	.75	.22	.12	$\chi^2(9, N = 175) = 86.14, p < .001$
Germany	.78	.58	.33	.15	$\chi^2(9, N = 266) = 267.58, p < .001$
India	.92	.84	.17	.09	$\chi^2(9, N = 366) = 107.26, p < .001$
Iran	.90	.85	.17	.08	$\chi^2(9, N = 150) = 48.57, p < .001$
Kyrgyzstan	.91	.60	.16	.11	$\chi^2(9, N = 339) = 90.64, p < .001$
New Zealand	.79	.83	.30	.09	$\chi^2(9, N = 210) = 175.31, p < .001$
Rwanda	.63	.36	.43	.22	$\chi^2(9, N = 119) = 208.28, p < .001$
Spain	.86	.89	.23	.07	$\chi^2(9, N = 142) = 73.03, p < .001$
UK	.95	.85	.13	.07	$\chi^2(9, N = 336) = 59.63, p < .001$
US (adult)	.68	.36	.40	.25	$\chi^2(9, N = 312) = 455.83, p < .001$
US (student)	.79	.86	.31	.07	$\chi^2(9, N = 450) = 402.02, p < .001$

Table 8. Descriptive statistics group sub-measure.

	Mean	SD	Min-Max	Skewness	Kurtosis	α
Finland	2.88	.26	2.33–3.67	–.01	.06	–.45
France	3.77	1.38	1.00–5.00	–1.04	–.37	.98
Germany	4.07	1.17	1.00–5.00	–1.63	1.59	.95
India	3.60	1.51	1.00–5.00	–.76	–1.00	.99
Iran	3.61	.79	1.19–5.00	–.60	.17	.79
Kyrgyzstan	3.48	.79	1.17–5.00	–.09	–.52	.76
New Zealand	3.93	1.34	1.00–7.00	–.01	–.03	.91
Rwanda	3.53	1.12	1.00–5.00	–.40	–.70	.88
Spain	3.53	1.50	1.00–5.00	–.69	–1.09	.99
UK	3.52	1.53	1.00–5.00	–.68	–1.13	.99
US (adult)	3.92	1.44	1.00–6.17	–.68	–.69	.77
US (student)	3.51	1.60	1.00–5.00	–.64	2.27	.99

Table 9. Descriptive statistics meeting sub-measure.

	Mean	SD	Min-Max	Skewness	Kurtosis	α
Finland	2.79	.42	1.50–4.17	.36	.78	–.18
France	3.79	1.22	1.00–5.00	–1.02	–.09	.94
Germany	4.04	1.10	1.00–5.00	–1.53	1.60	.93
India	3.60	1.27	1.00–5.00	–.63	–.84	.95
Iran	3.70	.75	1.67–5.00	–.24	.71	.76
Kyrgyzstan	3.17	.72	1.00–5.00	–.12	.32	.66
New Zealand	3.91	1.34	1.00–7.00	–.08	–.14	.93
Rwanda	3.30	.76	1.00–4.33	–.35	–.35	.60
Spain	3.59	1.36	1.00–5.00	–.67	–1.01	.98
UK	3.58	1.34	1.00–5.00	–.68	–1.13	.98
US (adult)	3.85	1.50	1.00–6.50	–.68	–.92	.82
US (student)	3.53	1.39	1.00–5.00	–.67	–1.25	.97

Table 10. Descriptive statistics interpersonal sub-measure.

	Mean	SD	Min-Max	Skewness	Kurtosis	α
Finland	2.93	.42	2.00–3.83	.01	–.32	–.02
France	4.11	.83	1.00–5.00	–1.67	2.60	.76
Germany	4.18	.72	1.50–5.00	–1.74	3.18	.59
India	4.24	.76	1.00–5.00	–1.84	4.47	.84
Iran	3.70	.67	1.17–5.00	–.38	–.26	.70
Kyrgyzstan	3.25	.68	1.17–5.00	.17	.28	.58
New Zealand	3.62	1.24	1.00–7.00	.04	.22	.90
Rwanda	3.78	.84	1.00–5.00	–.51	–.32	.74
Spain	3.94	.88	1.67–5.00	–1.33	.61	.73
UK	4.22	.64	1.00–5.00	–2.24	6.20	.73
US (adult)	3.71	1.40	1.00–6.17	–.63	–.94	.77
US (student)	3.76	1.00	1.67–5.00	–.78	2.27	.75

Table 11. Descriptive statistics public sub-measure.

	Mean	SD	Min-Max	Skewness	Kurtosis	α
Finland	2.96	.84	1.00–5.00	.11	–.49	.81
France	3.76	.64	1.00–5.00	–.77	1.69	.26
Germany	3.73	.48	1.50–5.00	–.69	2.27	–.63
India	4.11	.67	1.00–5.00	–1.18	2.38	.68
Iran	3.09	.42	1.83–4.17	–.26	–.26	–.34
Kyrgyzstan	.65	.38	1.50–5.00	.39	.15	.50
New Zealand	4.44	1.42	1.00–7.00	–.05	–.42	.91
Rwanda	3.49	.67	1.00–4.50	–.95	1.07	.31
Spain	3.60	.40	2.17–4.50	–.55	1.66	–1.38
UK	3.87	.46	1.50–5.00	–.65	2.41	–.05
US (adult)	3.94	1.29	1.00–6.17	–.99	–.11	.71
US (student)	3.45	.35	2.17–5.00	–.78	2.27	–2.87

low sample sizes ($n < 200$; Crede & Harms, 2019). As such, larger sample sizes may have exhibited acceptable RMSEA for the small sample groups, such as in Finland.

The only sub-measure that met the minimum threshold for fit statistics was group apprehension within the Indian sample. With acceptable GFI, CFI, and SRMR, the measure also yielded what Byrne (2016) would consider a ‘mediocre’ RMSEA (Byrne, 2016). Overall, the group sub-measure yielded the best fit among samples with one sample yielding fit and three samples yielding misfit of only RMSEA. Of the three samples that yielded elevated group apprehension RMSEA, two had samples less than 200, which may explain the misfit. As such, the group apprehension measure, while showing ample evidence of misfit, also yielded the most evidence of working well cross-culturally.

Discussion

The results of this study found that, consistent with the majority of intercultural research into CA, the PRCA-24 had strong reliability scores and acceptable descriptive statistics across languages (i.e. Spanish, German, Kurdish, English, Russian, French) and national cultures (i.e. France, Germany, India, Iran, Kyrgyzstan, Rwanda, Spain, UK, and US). Given the lack of validity evidence gathered in CA research, particularly cross-cultural research, these high reliability scores and acceptable descriptive statistics are consistent with prior evidence that has been used to give scholars confidence in the utility of the measure. However, the fit statistics yielded in this study universally point to validity concerns with the measure when used in these contexts. This is why it is imperative that scholars assess the validity of their measures for each sample, but most especially when they are using a measure in a language other than the one in which it was intended to be used (Croucher & Kelly, *in press*).

Implications

The findings from this validity analysis present several methodological and cultural implications. Although many of these implications will speak specifically to the use of the PRCA-24 as they are informed by this data set, they are implications for any cross-cultural work.

First, it is critical for researchers who use the PRCA-24 to better understand potential validity issues related to using the instrument. Validity issues with the PRCA-24 could be related to a variety of issues. It is possible that in some cultures, level of CA in a particular context might be influenced by cultural values such as humbleness or power distance. Triandis, McCusker, and Hui (1990) asserted that individuals in cultures higher in collectivism, tend to be humbler, meaning they avoid showing off and demonstrate more pride when communicating with others (Wang & Tamis-Lemonda, 2003). Therefore, the uneasiness of speaking out in front of others could be related to social and interpersonal consequences of the action, such as losing face, or other constructs related to, but different from, communication apprehension, such as shyness, unwillingness to communicate, reticence, or fright (McCroskey, 1982), and not the mere apprehension of giving a speech or nervousness in a conversation. Moreover, Oetzel et al. (2001) stated individualism/collectivism in interaction with power distance could affect facework enactment. In cultures with higher power distance, distinctions in CA between the context, where one feels higher power inequality, and the context in which one feels lower power inequality, could be sharper compared to low power-distance cultures. For example, in a high power-distance culture, CA related to group discussion among a set of students from the same level significantly differs from CA related to a group discussion involving students and a teacher. Further studies should investigate if situational CA varies for the same context with different perceptions of power-distance. In short, numerous cultural influences may change the conceptualization of a construct.

Second, the current study demonstrates the need to check the validity of measures within the measure's intended population. It is especially noteworthy that the PRCA-24 did not yield acceptable fit statistics even among US college students. Replication research among late Millennials and early Gen Z students has revealed that many of the measures designed to be used among Gen X students are not valid among modern college students (Autman & Kelly, 2017). The meaning of the items that compose these measures simply does not hold across generations of students. Thus, it is imperative to check the validity of measures even when the measure is used within its 'intended' population.

Third, the results reveal that apprehension contexts and perceptions differ culturally. Thus, the PRCA-24's contexts and their perceptions could be different across cultures. Political regimes, cultural norms and social traditions could constitute different contexts of CA. McCroskey (1977, 1982) identified public as a context, where one gives a speech like a public school, university and symposium, or a setting such as public speaking classes. Regardless of the fact that many will hardly have a chance to experience speaking in such a context, the social and political arrangements in some cultures essentially do not advocate such high levels of public participation similar to the US. Furthermore, different cultures could have different perceptions of the PRCA-24's contexts. The difference between meeting and small group, the boundaries of public, and the possible differences between the notions of 'friend' and 'acquaintance' are examples of such cultural diversity. For example, it is possible that someone from the Middle East might define 'public' as disclosing to a stranger in a bus or while waiting in a queue, which is categorized as, dyadic, by the PRCA-24. It is worth mentioning that cross-cultural issues with the PRCA-24 are not new, as Levine and McCroskey (1990) cautioned against the use of the PRCA-24, or its translation, in other national cultures because validity is questionable in other cultures. Measures that are free of specific contextual examples and that focus items on describing the psychological phenomenon being assessed are more likely to work cross-culturally (Autman & Kelly, 2017). This is an important consideration for the field of communication in a time in which many of the seminal measures are being refreshed to be utilized for cross-cultural and Gen Z research.

Fourth, the results demonstrate the significance of linguistic and sample equivalence. Two countries did not yield acceptable fit and indicated problems through descriptive statistics within the second-order unidimensional form: New Zealand and Finland. The first of these was Finland. Notably, the translation reliability for this sample was $\kappa = .72$. As such, the poor fit statistics may have been a result of linguistic equivalency, meaning that the connotative meanings of the items did not translate well denotatively. While the back-translation and reconciliation processes for this project involved professional translators, it is still possible that the Finnish data lacks linguistic equivalence. Previous researchers have reported validity and equivalence difficulties in translating concepts from the English language into the Finnish language (Hyrkäs, Appelqvist-Schmidlechner, & Paunonen-Ilmonen, 2003; Poplack, Wheeler, & Westwood, 1989). Finnish is a member of the Uralic language family, which is distinctly different from the language families that make up modern 'English.' Levine and McCroskey (1990) identified similar issues when translating the PRCA-24 from English into Spanish. Extra theoretical and methodological attention must be paid, not just in the Finnish language, when comparing across languages, as to whether linguistic equivalence or cultural variability is driving differences between groups. The second nation, New Zealand, while yielding a high reliability score, also yielded high skewness and high kurtosis. When examining the unidimensional sub-measures, the New Zealand sample yielded very little skewness and kurtosis. It also yielded acceptable reliability scores when used as a composite measure and within all four individual sub-measures. Yet, with these individual sub-measures containing some of the largest standard deviations among the unidimensional measures, combining the sub-measures for unidimensional fit creates substantially more outliers, yielding the skewness and kurtosis for the composite measure. As such, the sub-measures seem even more disjointed among the New Zealand sample than others examined in this study. This speaks to the need to consider unidimensional and second-order unidimensional fit when using such measures cross-culturally. This also provides an example of interesting findings that may be missed when validity is ignored. It would seem that each of these sub-measures may represent truly independent constructs in New Zealand, a topic that merits exploration by communication researchers.

The PRCA-24 was chosen for this study because of its prevalent use in the literature. However, the measurement issues addressed here should be considered when using any measure cross-culturally. The connotative meaning of words and the social influence of others (be they society, peer groups, or authority) change across international and generational groups (Autman & Kelly, 2017; Croucher & Kelly, *in press*; Violanti et al., 2018). Therefore, it is time to consider whether the age of the translators used for cross-cultural research, when generationally different from that of the target sample, could contribute to measurement error as the connotative meaning of words from their own generation are infused into the translations. This could lead to measures with excellent translation reliabilities still being composed of words whose denotative meanings differ greatly for the target sample.

Limitations and future research

The current study is not without limitations. In particular, most samples in this multi-national study are convenience samples; the New Zealand the US adult samples were random samples collected via Qualtrics. While such a sampling technique limits the generalizability of a study's results, non-random sampling is common when using the PRCA-24.

Samples can often be difficult to acquire for intercultural research. The present study was not able to collect the minimal recommended number of participants for conducting CFA in five of the 12 samples. While any well-collected data is helpful in understanding social phenomenon, it is important to recognize the impact that lower-power samples can have on analyses, such as the possible elevated RMSEA observed in this study for multiple sub-measures. As such, replication work is needed.

The results of this study offer avenues for future methodological and theoretical developments. Methodologically, cross-cultural researchers interested in communication apprehension must consider issues of validity and reliability. Croucher and Kelly (*in press*) identified three common validity

issues in older (and in some cases newer) communication measures that must be screened for before being used: measure quality assessment by Cronbach's alpha in lieu of a validity portfolio, prevalence of reverse coding yielding second false factors, and validity evidence provided coming from a sub-cultural or generational phenomenon (such as university students). Each of these issues is present in analysis and reporting of the PRCA-24. To address these concerns in the future, researchers using the PRCA-24 (and other measures) should conduct and report their own validity studies. It is also important to confirm the predicted factor structure of measures, such as the PRCA-24, through CFA. Moreover, researchers should report Cronbach's alpha with caution, as a major limitation of Cronbach's alpha is that the more items a measure has, the higher the reliability score by virtue of its formula (Nunnally & Bernstein, 1994; Peterson, 1994).

When conducting research in multiple languages, it is critical researchers take great care to insure translations are as accurate as possible. Oftentimes, particular terms cannot be directly translated from one language into another, and researchers must understand the cultural, contextual, and social aspects of the culture under investigation to develop a more reliable and valid translation (Brislin, 1970; Cha, Kim, & Erlen, 2007; Levine & McCroskey, 1990). Numerous strategies have been proposed to improve translation techniques (Banville, Desrosiers, & Gener-Volet, 2000).

Theoretically, future research should explore the extent to which the concept and contexts of 'communication apprehension' may have changed since the PRCA-24 was published in 1982. When the PRCA-24 was developed, the significance and prevalence of computer mediated communication (CMC) could not have been predicted. Items in the PRCA-24 focus exclusively on verbal/oral communication situations. Items also focus on 'group discussions,' 'meetings,' 'conversations,' 'a speech,' etc. With the proliferation of CMC, such contexts might have different denotations and connotations for respondents, even the same respondents who were originally used to validate the PRCA-24, university students. Thus, researchers should continue to explore how linguistic differences impact validity.

While researchers have long asserted US respondents tend to report lower levels of CA than most Asian, European, and African respondents, such assertions should be revisited. Without evidence of validity and measurement invariance in comparative studies, it is difficult to assert if such differences were measured with a valid measure of communication apprehension in the particular cultural contexts.

This study may serve as a model for future testing and validation of measurement models. The procedure used in this study can be applied to numerous instruments. With the increasing spread of communication research to non-US based contexts often using US-based models and methods, it is essential to be vigilant in the validation process. Such validation is critical to the production and reporting of valid and reliable results.

Acknowledgements

We acknowledge there may be additional research using the PRCA-24 between 1990 and 2018 using international samples. The authors would like to thank Mark Burkey for his assistance on this project.

Disclosure statement

No potential conflict of interest was reported by the authors.

References

- Allen, J. L., Long, K. M., O'mara, J., & Judd, B. B. (2008). Students' predispositions and orientations toward communication and perceptions of instructor reciprocity and learning. *Communication Education*, 57(1), 20–40. doi:10.1080/03634520701670908
- Andrew, J. (1996). Popular culture and public debate: London 1780. *The Historical Journal*, 39, 405–423.

- Autman, H., & Kelly, S. (2017). Reexamining the writing apprehension measure. *Business and Professional Communication Quarterly*, 80, 516–529. doi:10.1177/2329490617691968
- Banville, D., Desrosiers, P., & Gener-Volet, Y. (2000). Translating questionnaires and inventories using a cross-cultural translation technique. *Journal of Teaching in Physical Education*, 19, 374–387.
- Beatty, M. J. (1987). Communication apprehension as a determinant of avoidance, withdrawal and performance anxiety. *Communication Quarterly*, 35, 202–217.
- Beatty, M. J. (1988). Situational and pre-dispositional correlates of public speaking anxiety. *Communication Education*, 37, 28–39.
- Beatty, M. J., Frost, E. C., & Stewart, R. A. (1986). Communication apprehension and motivation as predictors of public speaking duration. *Communication Education*, 35, 143–146.
- Brislin, R. W. (1970). Back-translation for cross-cultural research. *Journal of Cross-Cultural Psychology*, 1, 185–216. doi:10.1177/135910457000100301
- Burroughs, N. F., Marie, V., & McCroskey, J. C. (2003). Relationships of self-perceived communication competence and communication apprehension with willingness to communicate: A comparison with first and second languages in Micronesia. *Communication Research Reports*, 20, 230–239.
- Byrne, B. M. (2016). *Structural equation modeling with AMOS: Basic concepts, applications, and programming*. New York: Routledge.
- Cha, E.-S., Kim, K. H., & Erlen, J. A. (2007). Translation of scales in cross-cultural research: Issues and techniques. *Journal of Advanced Nursing*, 58, 386–395. doi:10.1111/j.1365-2648.2007.04242.x
- Crede, M., & Harms, P. (2019). Questionable research practices when using confirmatory factor analysis. *Journal of Managerial Psychology*, 34, 18–30. doi:10.1108/JMP-06-2018-0272
- Croucher, S. M. (2013). An analysis of communication apprehension, self-perceived communication competence, and willingness to communicate: A French analysis. *Journal of International and Intercultural Communication*, 6, 298–316.
- Croucher, S. M. (2016). *Understanding communication theory: A beginner's guide*. New York: Routledge.
- Croucher, S. M. (2017). *Global perspectives on intercultural communication*. New York: Routledge.
- Croucher, S. M., & Kelly, S. (in press). Measurement in intercultural communication. In J. Mazer & E. Graham (Eds.), *Communication research measures III: A sourcebook*. Thousand Oaks, CA: Sage.
- Croucher, S. M., Rahmani, D., Hample, D., & Sakkinen, K. (2016). Communication apprehension, self-perceived communication competence, and willingness to communicate in Singapore. *Journal of Intercultural Communication*, 40. Retrieved from <https://www.immi.se/intercultural/nr40/croucher.html>
- Croucher, S. M., Sommier, M., Rahmani, D., & Appenrodt, J. (2015). A cross-cultural analysis of communication apprehension: A comparison of three European nations. *Journal of Intercultural Communication*, 38. Retrieved from <https://www.immi.se/intercultural/nr38/croucher.html>
- Dwyer, K. K. (1998). Communication apprehension and learning style preference: Correlations and implications for teachers. *Communication Education*, 47, 137–150.
- Fleiss, J. L. (1981). *Statistical methods for rates and proportions*. New York: John Wiley.
- Gudykunst, W. B. (2003). Issues in cross-cultural communication research. In W. B. Gudykunst (Ed.), *Cross-cultural and intercultural communication* (pp. 149–161). Thousand Oaks, CA: Sage.
- Gwet, K. (2014). *Handbook of inter-rater reliability*. Gaithersburg: Advanced Analytics.
- Hackman, M. Z., & Barthel-Hackman, T. A. (1993). Communication apprehension, willingness to communicate, and sense of humor: United States and New Zealand perspectives. *Communication Quarterly*, 41, 282–291.
- Hackman, M. Z., Ellis, K., Johnson, C. R., & Staley, C. (1999). Self-construal orientation: Validation of an instrument and a study of the relationship to leadership communication style. *Communication Quarterly*, 47, 183–195.
- Hassall, T., Joyce, J., Ottewill, R., Arquero, J., & Donoso, J. (2000). Communication apprehension in UK and Spanish business and accounting students. *Education & Training*, 42(2), 93–100.
- Hsiao, T. (2010). Testing rival measurement models of the Personal Report of Communication Apprehension in two Taiwanese samples. *Psychological Reports*, 107(1), 127–139. doi:10.2466/pr0.107.1.127-138
- Hsu, C. (1998). Relationships between family characteristics and communication apprehension. *Communication Research Reports*, 15, 91–98. doi:10.1080/08824099809362101
- Hsu, C. (2002). The influence of self-construals, family and teacher communication patterns on communication apprehension among college students in Taiwan. *Communication Reports*, 15, 123–132. doi:10.1080/08934210209367759
- Hsu, C. (2004). Sources of differences in communication apprehension between Chinese in Taiwan and Americans. *Communication Quarterly*, 52, 370–389. doi:10.1080/01463370409370207
- Hsu, C. (2007). A cross-cultural comparison of communication orientations between Americans and Taiwanese. *Communication Quarterly*, 55, 359–374. doi:10.1080/01463370701497831
- Hyrkäs, K., Appelqvist-Schmidlechner, K., & Paunonen-Ilmonen, M. (2003). Translating and validating the Finnish version of the Manchester clinical supervision scale. *Scandinavian Journal of Caring Sciences*, 17, 358–364. doi:10.1046/j.0283-9318.2003.00236.x
- Kuchukeeva, A., & O'Loughlin, J. (2003). Civic engagement and democratic consolidation in Kyrgyzstan. *Eurasian Geography and Economics*, 44, 557–587.

- Lahuerta, A. C. (2014). Factors affecting willingness to communicate in a Spanish university context. *International Journal of English Studies*, 14(2), 39–55.
- Levine, T. R., & McCroskey, J. C. (1990). Measuring trait communication apprehension: A test of rival measurement models of the PRCA-24. *Communication Monographs*, 57, 62–72.
- Martin, M. M., Valencic, K. M., & Heisel, A. D. (2002). The relationship between students' communication apprehension and their motives for communicating with their instructors. *Communication Research Reports*, 19, 1–7. doi:10.1080/08824090209384826
- McCroskey, J. C. (1977). Oral communication apprehension: A summary of recent theory and research. *Human Communication Research*, 4, 78–96.
- McCroskey, J. C. (1982). *An introduction to rhetorical communication* (4th ed.). Englewood Cliffs, NJ: Prentice Hall.
- McCroskey, J. C. (1992). Reliability and validity of the willingness to communicate scale. *Communication Quarterly*, 40, 16–25.
- McCroskey, J. C., & Beatty, M. J. (1984). Communication apprehension and accumulated communication state anxiety experiences: A research note. *Communication Monographs*, 51, 79–84.
- McCroskey, J. C., Beatty, M. J., Kearney, P., & Plax, T. G. (1985). The content validity of the PRCA-24 as a measure of communication apprehension across communication contexts. *Communication Quarterly*, 33, 165–173.
- Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric theory* (3rd ed.). New York: McGraw-Hill.
- Oetzel, J., Ting-Toomey, S., Masumoto, T., Yokochi, Y., Pan, X., Takai, J., & Wilcox, R. (2001). Face and facework in conflict: A cross-cultural comparison of China, Germany, Japan, and the United States. *Communication Monographs*, 68, 235–258. doi:10.1080/03637750128061
- Pederson, J., Tkachuk, H., & Allen, M. (2008). How perceived situational frequency and situational importance affect communication apprehension: A cross-cultural analysis. *Journal of Intercultural Communication Research*, 37, 189–198. doi:10.1080/17475750903135374
- Peterson, R. A. (1994). A meta-analysis of Cronbach's coefficient alpha. *Journal of Consumer Research*, 21, 381–391. doi:10.1086/209405
- Poplack, S., Wheeler, S., & Westwood, A. (1989). Distinguishing language contact phenomena: Evidence from Finnish-English bilingualism. *World Englishes*, 8, 389–406. doi:10.1111/j.1467-971X.1989.tb00677.x
- Pörhölä, M. (1997). Trait anxiety, experience, and the public speaking state responses of Finnish university students. *Communication Research Reports*, 14, 367–384.
- Pribyl, C. B., Keaten, J. A., Sakamoto, M., & Koshikawa, F. (1998). Assessing the cross-cultural content validity of the Personal Report of Communication Apprehension scale (PRCA-24). *Japanese Psychological Research*, 40, 47–53. doi:10.1111/1468-5884.00074
- Rubin, R. B., Graham, E. E., & Mignerey, J. T. (1990). A longitudinal study of college students' communication competence. *Communication Education*, 39, 1–14.
- Seibold, D. R., Rubin, R. B., & Rubin, A. M. (2009). Measurement in cross-cultural and intercultural communication. In R. B. Rubin, A. M. Rubin, E. E. Graham, E. M. Perse, & D. R. Seibold (Eds.), *Communication research measures II: A sourcebook* (pp. 57–75). New York: Routledge.
- Teven, J. J., Richmond, V. P., McCroskey, J. C., & McCroskey, L. L. (2010). Updating relationships between communication traits and communication competence. *Communication Research Reports*, 27, 263–270. doi:10.1080/08824096.2010.496331
- Triandis, H. C., McCusker, C., & Hui, C. H. (1990). Multimethod probes of individualism and collectivism. *Journal of Personality and Social Psychology*, 59, 1006–1020. doi:10.1037/0022-3514.59.5.1006
- Violanti, M., Kelly, S., Garland, M., & Christen, S. (2018). Instructor clarity, humor, immediacy, and student learning: Replication and extension. *Communication Studies*, 69, 251–262. doi:10.1080/10510974.2018.1466718
- Wang, S., & Tamis-LeMonda, C. S. (2003). Do child-rearing values in Taiwan and the United States reflect cultural values of collectivism and individualism? *Journal of Cross-Cultural Psychology*, 34, 629–642. doi:10.1177/0022022103255498
- Zarrinabadi, N. (2012). Self-perceived communication competence in Iranian culture. *Communication Research Reports*, 29, 292–298. doi:10.1080/08824096.2012.723271

Appendix

- Abdullah, A. T. (2014). Communication apprehension in using English Language among non-academic officers at a public university in Malaysia. *International Journal of Education and Research*, 2, 361–370.
- Al-Tamimi, N. O. (2014). Public speaking instruction: Abridge to improve English speaking competence and reducing communication apprehension. *International Journal of Linguistics and Communication*, 2(4). doi:10.15640/ijlc.v2n4a4
- Amogne, D., & Yigzaw, A. (2013). Oral communication apprehension, competence and performance among maritime engineering trainees. *Journal of Media and Communication Studies*, 5(1), 5–11.
- Arquero, J. L., Fernández-Polvillo, C., Hassall, T., & Joyce, J. (2017). Relationships between communication apprehension, ambiguity tolerance and learning styles in accounting students. *Revista de Contabilidad*, 20, 13–24. doi:10.1016/j.rcsar.2015.10.002
- Arquero, J. L., Hassall, T., Joyce, J., & Donoso, J. A. (2007). Accounting students and communication apprehension: A study of Spanish and UK students. *European Accounting Review*, 16, 299–322. doi:10.1080/09638180701391337
- Asmah, M., Bilki, U., & Duban, C. A. (2015). A comparison of the Turkish and Romanian students' willingness to communicate and its affecting factors in English. *Journal of Language and Linguistic Studies*, 11, 59–74.
- Bahadori, M., & Hashemizadeh, S. M. (2018). Relationship among self-perceived oral competence, communication apprehension, and Iranian EFL learners' willingness to communicate: cooperative teaching in focus. *International Journal of Foreign Language Teaching & Research*, 6(21), 75–96.
- Boman, J. S. (2013). Graduate student teaching development: evaluating the effectiveness of training in relation to graduate student characteristics. *Canadian Journal of Higher Education*, 43(1), 100–114.
- Booncherd, N., & Rimkeeratikul, S. (2017). Communication apprehension when speaking English (L2): A case study of personnel in an organization taking care of public health located in the suburb of Bangkok, Thailand. *Language Education and Acquisition Research Network (LEARN) Journal*, 10(1), 13–35.
- Boyd, J., Morgan, M., Ortiz, A. V., & Anderson, L. B. (2013). Taking initiative in the age of assessment. *Communication Teacher*, 28, 117–129. doi:10.1080/17404622.2013.865771
- Burroughs, N. F., Marie, V., & McCroskey, J. C. (2003). Relationships of self-perceived communication competence and communication apprehension with willingness to communicate: A comparison with first and second languages in Micronesia. *Communication Research Reports*, 20, 230–239.
- Byrne, M., Flood, B., & Shanahan, D. (2009). Communication apprehension among business and accounting students in Ireland. *Irish Accounting Review*, 16(2), 1–19.
- Christophel, D. M. (1996). Russian communication orientations: A cross-cultural examination. *Communication Research Reports*, 13, 43–51. doi:10.1080/08824099609362069
- Coetzee, S. A., Schmulian, A., & Kotze, L. (2014). Communication apprehension of South African accounting students: The effect of culture and language. *Issues in Accounting Education*, 29, 505–525. doi:10.2308/iace-50850
- Croucher, S. M. (2013). An analysis of communication apprehension, self-perceived communication competence, and willingness to communicate: A French analysis. *Journal of International and Intercultural Communication*, 6, 298–316.
- Croucher, S. M. (2013). The relationship between communication apprehension and linguistic fluency: An analysis of North African and Russian immigrants to France. *Russian Journal of Communication*, 5, 205–213.
- Croucher, S. M., Rahmani, D., Hample, D., & Sakkinen, K. (2016). Communication apprehension, self-perceived communication competence, and willingness to communicate in Singapore. *Journal of Intercultural Communication*, 40. Retrieved from <http://www.immi.se/intercultural/>
- Croucher, S. M., Sommier, M., Rahmani, D., & Appenrodt, J. (2015). A cross-cultural analysis of communication apprehension: A comparison of three European nations. *Journal of Intercultural Communication*, 38. Retrieved from <http://www.immi.se/intercultural/>
- Fushino, K. (2010). Causal relationships between communication confidence, beliefs about group work, and willingness to communicate in foreign language group work. *TESOL Quarterly*, 44, 700–724. doi:10.5054/tq.2010.235993
- Geçer, A. K., & Gümüş, A. E. (2010). Prediction of public and private university students' communication apprehension with lecturers. *Procedia – Social and Behavioral Sciences*, 2, 3008–3014. doi:10.1016/j.sbspro.2010.03.456
- Hackman, M. Z., Johnson, C. E., Barthal-Hackman, T. (1995). Correlates of talkaholism in New Zealand: An intracultural analysis of the compulsive communication construct. *Faculty Publications School of Business*. Paper 29.
- Hecimovich, M., & Volet, S. (2012). Tracing the evolution of chiropractic students' confidence in clinical and patient communication skills during a clinical internship: a multi-methods study. *BMC Medical Education*, 12(1). doi:10.1186/1472-6920-12-42
- Hsiao, T. (2010). Testing rival measurement models of the Personal Report of Communication Apprehension in two Taiwanese Samples. *Psychological Reports*, 107(1), 127–138. doi:10.2466/pr0.107.1.127-138

- Hsu, C. S. (2002). The influence of self-construals, family and teacher communication patterns on communication apprehension among college students in Taiwan. *Communication Reports, 15*, 123–132. doi:10.1080/08934210209367759
- Hsu, C. (2004). Sources of differences in communication apprehension between Chinese in Taiwan and Americans. *Communication Quarterly, 52*, 370–389. doi:10.1080/01463370409370207
- Hsu, C. (2007). A cross-cultural comparison of communication orientations between Americans and Taiwanese. *Communication Quarterly, 55*, 359–374. doi:10.1080/01463370701497831
- Jones, K. T., & Procopio, C. H. (2017). Mentoring at-risk middle school students to reduce communication apprehension. *Mentoring & Tutoring: Partnership in Learning, 25*, 185–201. doi:10.1080/13611267.2017.1326692
- Kaur, S., Suleiman, R. R., & Sidhu, G. K. (2012). Unpacking tertiary students' communication apprehension in Malaysia: Pedagogical implications for future employment. *International Journal of Learning, 18*, 223–236.
- Kearns, M., & Engelhard, I. M. (2015). Psychophysiological responsivity to script-driven imagery: An exploratory study of the effects of eye movements on public speaking flashforwards. *Frontiers in Psychiatry, 6*. doi:10.3389/fpsyt.2015.00115
- Khader, F. (2011). The effect of cooperative learning strategy in the reduction of the oral communication apprehension. *International Journal of Humanities and Social Science, 1*(14), 204–217.
- Kim, J. (2015). The effect of personality, situational factors, and communication apprehension on a blended communication course. *Indian Journal of Science and Technology, 8*(S1), 528. doi:10.17485/ijst/2015/v8is1/60760
- Kondo, D. S. (1994). Strategies for reducing public speaking anxiety in Japan. *Communication Reports, 7*, 20–26. doi:10.1080/08934219409367579
- Littel, M., Remijn, M., & Tinga, A. M. (2017). Stress enhances the memory-degrading effects of eye movements on emotionally neutral memories. *Clinical Psychological Science, 5*, 316–324.
- McCroskey, J. C., Burroughs, N. F., Daun, A., & Richmond, V. P. (1990). Correlates of quietness: Swedish and American perspectives. *Communication Quarterly, 38*, 127–137. doi:10.1080/01463379009369749
- McDowell, E. E. (1994). An exploratory study of PRCA-24 variables, receiver apprehension (RA) and telephone apprehension (TA) for college students from Australia and the United States. Paper presented at the Speech Communication Association: New Orleans.
- Mulalic, A., & Obralic, N. (2016). Willingness to communicate among Bosnian and Turkish students at International University of Sarajevo. *European Researcher, 107*, 330–338. doi:10.13187/er.2016.107.330
- Neuliep, J. W., Chadour, M., & McCroskey, J. C. (2003). A cross-cultural test of the association between temperament and communication apprehension. *Communication Research Reports, 20*, 320–330. doi:10.1080/08824090309388831
- Oladipo, S. E., Agbajeola, R. O., & Adenaike, F. A. (2012). Assessing communication apprehension among in-service teachers in a university of education. *Research on Humanities and Social Sciences, 2*(7), 27–31.
- Osman, N., Nayan, S., & Mansor, M. (2010). Spoken skills, communication apprehension and collaborative learning. *Cross-Cultural Communication, 6*, 117–124.
- Piechurska-Kuciel, E. (2013). Cognitive, affective and linguistic consequences of ethnocentrism in apprehensives' communication. *Linguistica Silesiana, 34*, 265–279.
- Pribyl, C. B., Keaten, J. A., Sakamoto, M., & Koshikawa, F. (1998). Assessing the cross-cultural content validity of the Personal Report of Communication Apprehension scale (PRCA-24). *Japanese Psychological Research, 40*, 47–53. doi:10.1111/1468-5884.00074
- Pryor, B., Butler, J., & Boehringer, K. (2005). Communication apprehension and cultural context: A comparison of communication apprehension in Japanese and American students. *North American Journal of Psychology, 7*, 247–252.
- Rachmi, E., & Khotimah, S. (2010). Reducing public communication apprehension by boosting self-confidence on communication competence. *Health Science Indonesia, 1*(1), 37–42.
- Radzuan, N. R., & Kaur, S. (2010). A survey of oral communication apprehension in English among ESL learners in an engineering course. *English for Specific Purposes World, 31*(10), 1–14.
- Radzuan, N. R., Ali, F., & Kassim, H. (2008). Developing speaking skills module for engineering students. *The International Journal of Learning, 14*(11), 61–70.
- Rahmani, D., & Croucher, S. (2017). Minority groups and communication apprehension. *Journal of Intercultural Communication, 43*. Retrieved from <http://www.immi.se/intercultural/nr43/rahmani.html>
- Rasakumar, A. (2017). Are female freshmen of arts apprehensive? A study based on Faculty of Arts, University of Jaffna, Sri Lanka. *International Journal of Innovative Research and Development, 6*(8). doi:10.24940/ijird/2017/v6/i8/aug17016
- Rasakumar, A., & Indra, D. S. (2017). Oral communication apprehension among freshmen: A case on the Faculty of Medicine. *Journal of Human Capital Development, 10*(1), 19–32.
- Rashidi, N., Yamini, M., & Shafei, E. (2011). Oral communication apprehension and affective factors: Self-esteem and introversion/extroversion. *Journal of English Language, 5*(7), 145–174.

- Razak, M. Z., & Yunus, N. K. (2013). Communication apprehension (CA): A case of accounting students. *International Journal of Independent Research and Studies*, 2(1), 16–27.
- Rimkeeratikul, S., Zentz, M., & Yuangsri, N. (2016). Communication apprehension in L1 and L2 among first-year students of a graduate program for executives in a public university. *Language Education and Acquisition Research Network (LEARN) Journal*, 9(1), 1–10.
- Ryzky, A. S., & Kusriandi, W. (2016). Examining oral communication apprehension, competence and performance among tourism students in vocational high school. *ELT Perspective*, 4(1), 9–17.
- Saberirad, H., Ahmadi, H., Fakhrmohamadi, E., & Sanei, S. (2016). Willingness to communicate, self-perceived communication competence and communication apprehension in L2 English: effect of Iranian junior high school textbooks. *Journal of Productivity and Development*, 2(2), 73–79.
- Sabri, U. (2014). Communication apprehension among Nilai College students. *Advances in Language and Literary Studies*, 5(5), 46–49. doi:10.7575/aiac.all.v5n.5p.46
- Sakamoto, M., Pribyl, C., & Keaten, J. (1997). Departmental differences in communication apprehension as measured by the Japanese Communication Fear Scale (JCFS). *The Japanese Journal of Research On Emotions*, 5(1), 10–23. doi:10.4092/jsre.5.10
- Sallinen-Kuparinen, A., McCroskey, J. C., & Richmond, V. P. (1991). Willingness to communicate, communication apprehension, introversion, and self-reported communication competence: Finnish and American comparisons. *Communication Research Reports*, 8, 55–64.
- Samvati, G. C., & Golaghaei, N. (2017). Iranian EFL learners' willingness to communicate, self-perceived communication competence, and communication apprehension in L1 and L2: A comparative study. *The Journal of English Language Pedagogy and Practice*, 10(20), 50–71.
- Shanahan, D. (2013). High oral communication apprehensives: How can students be helped to reduce their fear of public speaking? *Irish Journal of Academic Practice*, 2(1), 9th ser., 1–27. Retrieved from <http://arrow.dit.ie/ijap/vol2/iss1/9>
- Sinnasamy, J., & Karim, N. H. (2015). Academic related anxieties: a case study investigating the relationships among library, communication and language anxieties among non-native speakers of English. *Malaysian Journal of Library & Information Science*, 20(2).
- Stupar-Rutenfrans, S., Ketelaars, L. E., & Gisbergen, M. S. (2017). Beat the fear of public speaking: Mobile 360° video virtual reality exposure training in home environment reduces public speaking anxiety. *Cyberpsychology, Behavior, and Social Networking*, 20, 624–633. doi:10.1089/cyber.2017.0174
- Thomas, M., Noordin, N., & Francis, P. (2016). Overcoming communication apprehension with emotional intelligence skills. *Journal of Social Sciences (COES&RJ-JSS)*, 5(3), 201–211. doi:10.25255/jss.2016.5.3.201.211
- Wilson, R. (2006). Numeracy and literacy in sports studies students: barriers to skills development. *The Journal of Hospitality Leisure Sport and Tourism*, 5(2), 59–70. doi:10.3794/johlste.52.97
- Yaikhong, K., & Usaha, S. (2012). A measure of EFL public speaking class anxiety: Scale development and preliminary validation and reliability. *English Language Teaching*, 5(12). doi:10.5539/elt.v5n12p23