



PSYCHOMETRIC PROPERTIES OF THE INTERCULTURAL COMPETENCE QUESTIONNAIRE: APPLICATIONS IN SPORTS EDUCATORS

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Abstract:

This study examines the psychometric properties of Fantini's (2000) Intercultural Communicative Competence (ICC) Questionnaire, focusing on its applicability in assessing intercultural competence among sports educators. The study aims to examine the factorial structure of the questionnaire and evaluate its reliability. The sample consisted of 315 physical education and sport science students. Participants completed the adapted to Greek language version of the ICC comprising 28 items measuring four factors, namely Knowledge, Behavior, Awareness, and Skills. An exploratory factor analysis (EFA) was conducted on the ICC Questionnaire, revealing a four-factor structure accounting for 60.5% of the total variance. All items loaded on the original factor provided preliminary evidence on the factorial validity of the scale. The reliability of the extracted factors was assessed using Cronbach's alpha, and the analysis revealed adequate scores for all subscales ($\alpha > .78$). A confirmatory factor analysis (CFA) further supported the four-factor model, indicating a satisfactory model fit (CFI = .920). All factor loadings were statistically significant, aligning with the theoretical structure of the questionnaire. The results suggest that the ICC Questionnaire is a valid and reliable tool for assessing intercultural competence in sports education contexts and provide a foundation for further research on cross-cultural applicability and intervention-based competency development.

Keywords: intercultural competence, sports education, team cohesion, multiculturalism, psychometric analysis

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1. Introduction

Intercultural competence is increasingly recognized as a critical skill in diverse professional and educational settings, particularly in sports education, where multicultural interactions are frequent. The ability to communicate effectively across cultural boundaries is essential for fostering inclusive environments, enhancing team cohesion, and improving educational and athletic outcomes (Deardorff, 2006; Schinke & McGannon, 2015). Given this significance, reliable and valid assessment tools are necessary to measure intercultural competence and guide intervention strategies. One of the most widely used instruments for assessing intercultural competence is the Intercultural Communicative Competence (ICC) Questionnaire, developed by Fantini (2000). However, despite its broad application in various cultural and educational contexts, limited research has examined its psychometric properties, particularly within sports education. Ensuring the questionnaire's validity and reliability through robust statistical analyses is essential for confirming its theoretical framework and practical applicability. To address this gap, this study employs exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) to examine the ICC Questionnaire's factorial structure. Establishing a validated factor structure strengthens the ICC Questionnaire's credibility as a measurement tool and enhances its application in sports education.

By integrating both EFA and CFA, this study aims to provide a comprehensive validation of the ICC Questionnaire, ensuring its suitability for assessing intercultural competence among sports educators. The findings will contribute to the refinement of the instrument and inform future research on intercultural competence development in multicultural sports environments.

2. Intercultural Competence

The concept of intercultural competence has gained increasing importance in a globalized world, where effective communication across cultural boundaries is a fundamental skill. Scholars define intercultural competence as the ability to interact effectively and appropriately with individuals from diverse cultural backgrounds (Deardorff, 2006; Fantini, 2000). This competence is typically conceptualized as a multidimensional construct, incorporating cognitive (knowledge of cultural norms and communication styles), affective (openness, empathy, and adaptability), and behavioral (skills in intercultural interaction and conflict resolution) components (Byram, 1997). Fantini (2000) further elaborates on intercultural competence by identifying four core dimensions: Knowledge, Awareness, Skills, and Attitudes, which collectively enable individuals to navigate and engage in cross-cultural interactions successfully.

The research underscores the significance of intercultural competence in various professional domains, particularly in education, business, and sports, where individuals frequently interact with culturally diverse groups (Deardorff & Arasaratnam-Smith, 2017). In sports education, intercultural competence is essential for fostering inclusive

learning environments, enhancing team cohesion, and improving communication between coaches and athletes from different cultural backgrounds (Schinke & McGannon, 2015).

Studies indicate that interculturally competent coaches and educators can better understand and respond to the unique needs and motivations of athletes, ultimately promoting both personal and professional development (Matsumoto & Hwang, 2013). Given its importance, assessing and developing intercultural competence through reliable psychometric tools remains a critical area of research, particularly in applied contexts such as sports education. One of the most widely recognized tools for assessing intercultural competence is the Intercultural Communicative Competence Questionnaire (ICC), developed by Fantini in 2000.

One of the most widely recognized tools for assessing intercultural competence is the Intercultural Communicative Competence Questionnaire (ICC), developed by Fantini in 2000. This instrument was designed to measure individuals' ability to communicate effectively and appropriately with people from different cultural backgrounds. The ICC questionnaire assesses four key domains of intercultural competence: Awareness, Behavior, Skills and Knowledge (Fantini, 2000; Deardorff, 2009).

Knowledge refers to the cognitive understanding of different cultural values, beliefs, and communication styles, allowing individuals to navigate intercultural interactions effectively (Byram, 1997). Skills encompass the ability to interpret and relate to different cultural contexts, including active listening, problem-solving, and adaptability in intercultural settings (Spitzberg & Chagnon, 2009). Awareness involves self-reflection and critical consciousness of one's own cultural biases and perspectives, fostering openness toward diverse worldviews (Bennett, 1993). Behavior captures the ability to act appropriately and effectively in intercultural interactions, demonstrating respect, empathy, and flexibility in communication styles (Hammer, Bennett, & Wiseman, 2003). These factors align with widely accepted models of intercultural competence, including Deardorff's (2006) process model and Byram's (1997) five-skill model, both of which emphasize the dynamic and multidimensional nature of intercultural competence.

2.1 Factorial Validity of ICC Questionnaire

The ICC questionnaire was initially implemented in intercultural environments within the United States of America but has since been adapted for use in various countries, reflecting its global applicability. In Greece, the first translation and cultural adaptation of the ICC took place in the early 2000s, targeting the educational system and culturally diverse sectors such as tourism and international business (Sideri, 2006). Early studies in Greece demonstrated similar levels of internal reliability, supporting the tool's consistency within the Greek context.

Nevertheless, the adaptation process highlighted the necessity of conducting localized validation studies, including factor analysis, to account for cultural nuances that may influence respondents' interpretations of the items. For example, constructs such as

sensitivity to cultural differences and willingness to engage with individuals from other cultural backgrounds may vary across cultural settings, potentially affecting the instrument's validity (Arasaratnam, 2009).

Despite its widespread use in various intercultural contexts, including student exchange programs, international organizations, and multicultural educational settings, limited research has been conducted on the factorial structure of the ICC questionnaire. Factor analysis is crucial for validating the underlying theoretical framework of the questionnaire and ensuring that the instrument accurately captures the constructs it aims to measure (Fabrigar, Wegener, MacCallum, & Strahan, 1999; Hair, Black, Babin, & Anderson, 2019; Kline, 2015). Specifically, the ICC is built on the premise that intercultural competence is a multidimensional construct. Previous studies have examined the internal consistency of the ICC subscales and reported high internal consistency for the ICC questionnaire, with Cronbach's alpha values typically ranging from 0.70 to 0.90, indicating strong reliability. Still, verifying the factor structure of the questionnaire through exploratory and confirmatory factor analyses is essential for enhancing its psychometric robustness (Byram, 1997; Matsumoto & Hwang, 2013). For instance, distinguishing between the four proposed subscales (knowledge, skills, attitudes, and sensitivity) can provide greater clarity on how these dimensions interact and contribute to overall intercultural competence (Fantini & Tirmizi, 2006; Kérchy, 2020). Thus, the need for a deeper understanding of the questionnaire's dimensionality remains critical.

The application of the ICC questionnaire in the domain of sports education also represents a relatively unexplored area. Sports educators often operate in highly multicultural environments, where intercultural competence is a critical skill for fostering inclusive and effective communication among diverse participants (Schinke & McGannon, 2015). The investigation of the factorial validity of the ICC questionnaire in this specific context is essential for verifying its suitability and ensuring that it captures the unique aspects of intercultural interactions within sports settings.

Given the growing importance of intercultural competence in diverse professional and educational contexts, the need to examine the psychometric properties of the ICC questionnaire is evident. To address these needs, the present study set out to investigate the factorial validity and reliability of the ICC questionnaire in physical education and sports sciences students who will become physical education teachers and sports coaches in a multicultural environment. Exploratory and confirmatory factor analyses not only reinforce the theoretical foundations of the instrument but also ensure its practical applicability across different cultural and professional domains, including sports education.

3. Material and Methods

3.1 Sample

The current study involved a total of 315 physical education and sport science students from the Department of Physical Education and Sport Science at the Aristotle University of Thessaloniki (148 males and 167 females). Participants were in their third and fourth years of study, with ages ranging from 21 to 25 years ($M = 21.5$, $SD = .65$). Ethical approval for the study was granted by the Ethics Committee of the Department of Physical Education and Sport Science of the Aristotle University of Thessaloniki.

Data collection was conducted through convenience sampling, with students voluntarily completing the questionnaires after being invited to participate in the intercultural competence survey.

3.2 Measures

The **Intercultural Communicative Competence Questionnaire (ICC)**, developed by Fantini in 2000, was used to assess intercultural communication. The instrument comprises a total of 28 questions that assess four core domains of intercultural competence: **Awareness, Behavior, Skills and Knowledge**. The questions are rated on a five-point Likert scale, ranging from "Not at all" to "Extremely."

Examples of questions for each subscale include:

- **Awareness:** "I am aware of my own level and stage of intercultural development (e.g., regarding sensitivity, empathy, ethical issues, linguistic communication, etc.)."
- **Behavior:** "I am willing to demonstrate appreciation and interest in individuals and groups of specific cultural backgrounds."
- **Skills:** "I assist in resolving intercultural conflicts and misunderstandings."
- **Knowledge:** "I am capable of discussing aspects of other cultures through the professional lens of intercultural education."

The scale was translated into Greek via the back-translation technique (Brislin, 1970; Beaton *et al.*, 2000), a widely endorsed method for ensuring linguistic and conceptual equivalence in cross-cultural research. In this procedure, two independent bilingual translators first produced a forward translation into Greek. A separate bilingual expert, who was blinded to the original version, then performed a back-translation into the source language. Discrepancies between the original and back-translated versions were meticulously reviewed by an expert panel, and adjustments were made until semantic and cultural nuances were satisfactorily aligned. This rigorous process not only enhances the reliability and validity of the scale but also ensures that the translated version accurately reflects the constructs measured in the original instrument (Sousa & Rojjanasrirat, 2011).

3.3 Data Analysis

An exploratory factor analysis (EFA) via SPSS 29.0 was employed. The principal component method with varimax rotation was used. The Kaiser–Meyer–Olkin (KMO) measure of sample adequacy and Bartlett’s test of sphericity were utilized to assess the suitability of the factor analysis (Kaiser, 1974). Moreover, other criteria used included the factor loadings and the number of factors that emerged. The factor loading of an item should have been higher than 0.4, and the number of factors was established using a scree plot with factors with eigenvalues higher than 1, indicating the number of appropriate factor structures (Kline, 2015Nun). In addition, confirmatory factor analysis (CFA) through Mplus 8.0 was employed to evaluate the structure derived from the EFA. Due to the heightened sensitivity of chi-square statistics, the incremental fit indices were mainly taken into consideration to assess the model's goodness of fit. More specifically, the Root Mean Square Error of Approximation (RMSEA) and the Standardized Root Mean Square Residual (SRMR) should be lower than 0.08, the Comparative Fit Index (CFI) and Tucker-Lewis Index (TLI) should be higher than .90 to demonstrate adequate model fit (Bentler, 1990; Hu & Bentler, 1999).

4. Results

In relation to Fantini's (2000) questionnaire, the exploratory factor analysis conducted showed that the data were suitable for the factor analysis, KMO= .80, Bartlett’s test of sphericity $\chi^2 = 313.18$, $df = 6$, $p < .001$. The results of the analysis resulted in four factors that explained 60.5% of the total variance. The results of the analysis are presented in Table 1, with the exception of item 6, which showed low and multiple loadings, all times loaded on the original factor with adequate loading. Item 6 was excluded from further analyses. The four factors identified through the analysis were "Awareness," "Behavior," "Skills," and "Knowledge."

The Cronbach’s alpha coefficients for these factors were satisfactory (Table 1), indicating high internal consistency for the dimensions derived from the factor analysis (Pedhazur, and Schmelkin, 1991). The results of the confirmatory factor analysis further supported the solution provided in the exploratory factor analysis, RMSEA = .06, CFI = .920, TLI = .906, SRMR = .07. All loadings were statistically significant and loaded on the correct factor. With the exception of the loading of item 7 that was .36 all other loadings were above .49 (see Table 1).

Table 1: Exploratory and confirmatory factor analysis of the Intercultural Communicative Competence (ICC) questionnaire (Fantini, 2000)

| Item | Knowledge | Behavior | Awareness | Skills | Communalities |
|-------------------------------------|------------|------------|------------|------------|---------------|
| 1 | | | .64 (.59*) | | .51 |
| 2 | | | .68 (.68*) | | .54 |
| 3 | | | .79 (.69*) | | .67 |
| 4 | | | .74 (.72*) | | .64 |
| 5 | | | .65 (.71*) | | .54 |
| 7 | | | .56 (.68*) | | .48 |
| 8 | | .75 (.36) | | | .59 |
| 9 | | .75 (.58*) | | | .58 |
| 10 | | .82 (.65*) | | | .69 |
| 11 | | .76 (.76*) | | | .65 |
| 12 | | .77 (.79*) | | | .65 |
| 13 | | .80 (.75*) | | | .65 |
| 14 | | | | .44 (.59*) | .46 |
| 15 | | | | .63 (.49*) | .47 |
| 16 | | | | .65 (.58*) | .56 |
| 17 | | | | .57 (.61*) | .53 |
| 18 | | | | .60 (.78*) | .65 |
| 19 | | | | .54 (.68*) | .58 |
| 20 | .62 (.66*) | | | | .62 |
| 21 | .73 (.75*) | | | | .62 |
| 22 | .79 (.78*) | | | | .69 |
| 23 | .75 (.78*) | | | | .62 |
| 24 | .80 (.80*) | | | | .70 |
| 25 | .81 (.83*) | | | | .72 |
| 26 | .82 (.76*) | | | | .70 |
| 27 | .72 (.70*) | | | | .57 |
| 28 | .70 (.66*) | | | | .53 |
| Eigenvalues | 9.58 | 3.57 | 2.00 | 1.17 | |
| % Variance Explained | 35.41 | 13.23 | 7.44 | 4.35 | |
| Cronbach α | 0.92 | 0.87 | 0.84 | 0.78 | Total .92 |
| Mean score | 2.9 | 4.15 | 3.53 | 3.2 | |
| Standard Deviation | 0.84 | 0.64 | 0.64 | 0.72 | |

Note: Values outside parentheses reflect the loadings of the EFA; values in parentheses reflect scores of the CFA; $p < 0.001$.

5. Discussion

The findings from the exploratory factor analysis of the Intercultural Communicative Competence (ICC) Questionnaire (Fantini, 2000) provide valuable insights into its dimensional structure, reinforcing both its theoretical foundation and practical applicability in assessing intercultural competence. The emergence of four distinct factors of the original questionnaire, Knowledge, Behavior, Awareness, and Skills, underscores the robustness of the questionnaire in capturing the key components of intercultural competence. These results align with Fantini's (2000) original conceptualization, which

defines ICC as a multidimensional construct encompassing cognitive, affective, and behavioral dimensions.

In addition, the results of the confirmatory factor analysis (CFA) provide strong support for the factor structure identified in the exploratory factor analysis (EFA), demonstrating the validity and robustness of the Intercultural Communicative Competence (ICC) Questionnaire. The model fit indicates an acceptable to good fit, confirming that the proposed four-factor structure adequately represents the underlying dimensions of intercultural competence.

In both analyses, the items loaded on the expected factors further reinforce the construct validity of the instrument. In the CFA, all items were statistically significant. With the exception of one item, all loadings exceeded the recommended threshold, suggesting that the majority of items contribute meaningfully to their respective latent constructs. Particularly strong loadings were observed in Factor 4 (Skills), emphasizing the clarity and consistency of this dimension within the model.

These findings align with previous research validating multidimensional models of intercultural competence (Deardorff, 2006; Matsumoto & Hwang, 2013) and highlight the ICC Questionnaire's applicability in sports education and multicultural team environments. The strong factor structure suggests that this tool is psychometrically sound and can be reliably used to measure intercultural competence among athletes, coaches, and sports educators.

These results have important implications for the application of the ICC questionnaire in educational and professional contexts. The identified factors align with key competencies required for effective intercultural communication, as highlighted by Schinke and McGannon (2015). Specifically, the high reliability and clear structure of the questionnaire suggest its suitability for assessing and developing intercultural competence among educators, students, and professionals operating in multicultural environments.

6. Recommendations

Firstly, future studies should investigate the concurrent and discriminant validity of the questionnaire, which was not evaluated in the current study. In addition, future research should explore the cross-cultural validity of the ICC questionnaire across different cultural and professional settings to further establish its generalizability. Moreover, longitudinal studies could provide deeper insights into how specific interventions or training programs influence the development of intercultural competence over time. The existence of a validated questionnaire could assist sports organizations and coaching academies in systematically assessing and developing intercultural competence among athletes, coaches, and sports educators and evaluating targeted educational interventions.

Importantly, sport-specific modifications of the questionnaire should be tested to enhance its applicability across different disciplines and competitive levels.

7. Conclusion

This study's findings underscore the ICC Questionnaire's validity as a reliable tool for assessing this multidimensional construct. By confirming the four-factor structure, Knowledge, Behavior, Awareness, and Skills, this research provides a solid foundation for the use of the questionnaire in future studies examining intercultural competence in the sports domain.

Conflict of Interest Statement

The authors declare no conflicts of interest.

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